Mounting instructions

Natura 60

Code No. 99-97-2071

Edition: 08/2007 GB

Overview of changes / updates in the manual

06/2007:

Code no	**Description**
83-03-9707	Post KB-flat middle NAT-60/BD-C2+
replaced by:	
83-04-3257	Post KB-flat middle NAT-60/BD-C2+

Code no	**Description**
83-03-9710	Post in front of nest 2412 NAT-60
replaced by:	
83-04-3258	Post in front of nest 2412 NAT-60

Code no	**Description**
83-03-9709	Post feeding side NAT-60
replaced by:	
83-04-3262	Post feeding side NAT-60

Code no	**Description**
83-03-9726	Footrail 1206 f/feedtrough pluggable NAT-60
replaced by:	
83-04-3263	Footrail 1206 f/feedtrough pluggable NAT-60

Code no	**Description**
83-03-9724	Sheet metal perch 2412 112mm wide NAT-60
replaced by:	
83-04-3282	Sheet metal perch 2412 112mm wide NAT-60

Code no	**Description**
83-03-9683	Extension separating wire mesh manure-belt level 1200 NAT-60-1800
replaced by:	
83-04-3259	Extension separating wire mesh manure-belt level 1200 NAT-60-1800

Code no	**Description**
83-03-9697	Extension separating wire mesh manure-belt level 1540 NAT-60-1800
replaced by:	
83-04-3260	Extension separating wire mesh manure-belt level 1540 NAT-60-1800

Code no	**Description**
83-03-9721	Support f/bottom wire grill manure-belt level 1540 NAT-60-1800
replaced by:	
83-04-3264	Support f/bottom wire grill manure-belt level 1540 NAT-60-1800

Code no	**Description**
83-03-9722	Support f/bottom wire grill manure-belt level 1200 NAT-60-1800
replaced by:	
83-04-3265	Support f/bottom wire grill manure-belt level 1200 NAT-60-1800

Code no	**Description**
83-03-9711	Cross connector lower level in front of nest NAT-60-1800
replaced by:	
83-04-3261	Cross connector lower level in front of nest NAT-60-1800

Name of chapter	**Type of change / update**	**No. of BD product information**	**Revision date**	**Page**
3 Management recommendations for Natura 60	**Chapter inserted with management recommendations for Natura60**		07/2007	16

miscellaneous	**Amendments inserted:** - assembly of end-set - drives for ejection mechanism single row/double row - drive for collapsi-ble grille		08/2007	miscellane-ous

1 Basic instructions 1
1.1 Basics 1
1.2 Explaining the symbols 2
1.2.1 Safety symbols in this manual 2
1.2.2 Safety symbols in the manual and on the installation 2
1.2.3 Safety symbols and notes on your installation 3
1.3 Designated use 4
1.4 General safety instructions 4
1.5 Safety instructions when operating electrical appliances 5
1.6 Dangers resulting from non-compliance with the safety instructions 6
1.7 Clothing for personal safety 6
1.8 Assembly and maintenance 7
1.9 Employing external personnel 7
1.10 Ordering spare parts 8
1.11 Obligations 8
1.12 Warranty and liability 9
1.13 Disorders due to power failure 9
1.14 First aid 9
1.15 Waste disposal 10
1.16 Notes for use 10
1.17 Copyright 10
2 Special safety instructions 11
2.1 Personal safety instructions 11
2.2 Clothing and procedures for personal safety 11
2.2.1 Clothing and footwear 11
2.2.2 Jewellery 11
2.2.3 Hair 12
2.3 System safety instructions 12
2.3.1 Entire system 12
2.3.2 Individual components 13
2.3.2.1 Feeding system 13
2.3.2.2 Water supply 13
2.3.2.3 Egg collection system 13
2.3.2.4 Manure removal 14
2.3.2.5 Electrical components 15
2.3.2.6 Ventilation system 15
3 Management recommendations for Natura 60 16
3.1 Before and after the birds are moved in: 16
3.2 Nest management 16
3.3 Opening of the litter area 18
3.4 Miss laid eggs on the tiers (system-eggs) and miss laid eggs in the scratching area (floor eggs) 18
3.5 Feeding 19
3.6 Drinkers 19
3.7 Lighting 19
3.7.1 Lights both in the aisle area and in the system (below the manure belt levels) as well as a hose light in the "stairway" of Natura 60 20
3.7.2 Lights only in the aisle area as well as a hose light in the entrance area of Natura 60 . 20
3.8 Flock control, daily monitoring 21
3.9 Summary / figures related to practice 21
4 Operational safety and orders for spare parts 22

5 Recommended assembly order 23
5.1 Assembly order of the components to be mounted 23
6 Assembling the stands 24
6.1 Positions of the cage stands 2412 and 1206 in a row 24
6.2 Pre-assembly of the stand foot extensions 26
6.3 Alignment of the posts of the cage stands 2412 and 1206 27
6.4 Assembly of the cage stands 2412 28
6.4.1 Overview individual parts cage stand 2412 (beginning / end of a section) 28
6.4.2 Overview individual parts cage stand 2412 (beginning / end of a section) 30
6.4.3 Screwing of the separating wire mesh extensions and sheet metal for cover 33
6.4.4 Assembly of the suspension material for feed trough and tube 36
6.4.4.1 Screwing of the suspension material for the feed trough and for the perches 37
6.4.5 Assembly of the separating wire mesh 38
6.4.5.1 Detail views separating wire mesh 39
6.4.5.2 Fastening of the wire meshes 40
6.5 Assembly cage stand 1206 (centre of section) 41
6.5.1 Assembly cage stand 1206 (centre of section) 41
6.5.2 Screwing of cage stand 1206 (centre of section) 43
7 Setting up the carcass 45
7.1 Installation of the side rails 45
8 Assembly of the approach grates at the top in front of the nest 48
8.1 General view 48
8.2 Assembly of the support for approach grating 49
8.3 Installation of the retainer f/ the approach grating in front of nest 50
8.4 Installation of the rods for the approach grating in front of the nest 51
8.5 Laying out the approach gratings in front of the nest 52
8.5.1 Fixation of the approach gratings by means of clips 54
9 Assembly of the upper perch in front of the nest, drinkers and roof wire rails 55
9.1 General view 55
9.2 Assembly of the drinkers 56
9.2.1 Insertion of the nipple tubes in the cross supports 56
9.2.2 Connecting the nipple pipes 57
9.2.3 Installation of the drip water cups at the nipple tube 58
9.3 Installation of the upper perches 59
9.3.1 Insertion of the tubes 59
9.3.2 Coupling and screwing of the tubes 59
9.4 Assembly of the roof wire rails 60
10 Assembly of the nests 61
10.1 Assembly of the nest floor with tubular transmission for the nest floor 61
10.1.1 Assembling the drive in the middle of a row (single row) 62
10.1.1.1 Component parts of drive for ejection mechanism (EWA12 single row) 63
10.1.1.2 Screwing - cross connector single 64
10.1.1.3 Screwing - cross bars for motor suspension 65
10.1.1.4 Screwing - drive at cross bars for motor suspension 66
10.1.1.5 Screwing - worm gear pair 67
10.1.2 Assembling the drive in the middle of the row (double row) 68
10.1.2.1 Component parts of drive for ejection mechanism (EWA double row) 69
10.1.2.2 Screwing of the component parts for ejection mechanism for double row 70
10.1.3 Nestfloor drive tubes 70
10.1.3.1 Connection of the tubes 71

10.1.3.2 Fixing of the nestfloor drive tubes to the drive 74
10.1.4 Assembly of the nest bottom 75
10.1.4.1 Insertion of the threaded rods and supporting rods for the nest bottom inlay 75
10.1.4.2 Installing the wire ropes for the nest floor resetting mechanism 77
10.1.4.3 Hooking the wire rope for nest floor resetting mechanism into the tilting floor 78
10.1.4.4 Insertion of the floor units and towing ropes for the nest floor drive 79
10.1.4.5 Fixing the traction ropes to the tilting floor 80
10.1.4.6 Fixing the traction ropes at the tube 1” for nest floor drive 81
10.1.4.7 Positions of bearing shells within the nest holes 82
10.1.4.8 Placing the traction rope tappet into the half 82
10.1.5 Assembly of the nest back walls and sheet metal partitions 85
10.1.5.1 Installation of the rods and fastening rail for the back wall 85
10.1.5.2 Insertion of the sheet metal partitions 86
10.1.5.3 Insertion and fastening of nest back wall 87

11 Installation of the centre and lower bottom wires 90
11.1 Insertion of the manure belt supports 90
11.2 Insertion of wire hooks and rods 91
11.3 Installation of approach sheets and foot rails 92
11.4 Insertion of the wire ropes beneath the sheet metal perches 94
11.5 Placement of bottom wire grilles (centre and bottom tier) 96

12 Assembly of the air ducts (option) 98

13 Assembly of feed troughs and tubes (perches) 100
13.1 Position of the feed troughs in the section 100
13.2 Assembly of the tubes (perches) and the cover V-profile 101
13.3 Installing the outer feed troughs 103

14 Installing the egg channel 105
14.1 Assembly of the support 2412 for wire grille for egg channel 106
14.2 Laying out the wire grille for the egg channel 107
14.3 Screwing the wire grille to the support 108
14.4 Attachment of the wire grille at the support for egg channel 109

15 Assembly of the stainless steel covers and posts 603 110
15.1 Assembly of the posts 603 for sliding front 111
15.2 Assembly of the stainless steel covers 112
15.2.1 Fixation of the covers at the post 603 115

16 Assembly of sliding fronts and collapsible grilles 116
16.1 Positon of the grilles in a section 116
16.2 Overview of sliding fronts and collapsible grilles 117
16.3 Assembly sliding front staircase (top and bottom) 119
16.3.1 Insertion of the sliding fronts and of the upper rods 119
16.3.2 Inserting the lower rods and the fasteners for the sliding fronts 121
16.4 Assembly of the sliding fronts below the nest 123
16.4.1 Assembly of the T-brackets and support angles for fastener sliding front 123
16.4.2 Inserting the rods and the fasteners for the sliding fronts 125
16.4.2.1 Connecting the rods 127
16.4.3 Inserting the cage fronts 128
16.4.3.1 Insertion at the feed trough 128
16.4.3.2 Insertion of the side rails in the scratching area 129
16.5 Assembly of the collapsible grids 130
16.5.1 Insertion of the square tube 130
16.5.1.1 Coupling the rectangular tube 132
16.5.2 Insertion and screwing of the collapsible grids 134

16.5.3 Assembling the drive for collapsible grille (option) . . . 135
16.5.3.1 Components of drive for collapsible grille . . . 137
16.5.3.2 Pre-assembly of the support . . . 138
16.5.3.3 Assembly of the support into the section . . . 139
16.5.3.4 Fixing of the drive to the rectangular tube and motor brace . . . 142
16.5.3.5 Inserting the front covering . . . 143
17 Assembly of the foot rails behind the nest . . . 144
18 Assembly of the plate in the scratching area . . . 146
19 Assembly of the top wire mesh . . . 148
20 Assembly of the end-sets . . . 150
20.1 Total view of end-sets . . . 150
20.2 Assembly of the manure belt drive unit . . . 152
20.2.1 Assembly of the substructure for the manure belt drive . . . 154
20.2.2 Pre-assembly of the manure belt drive . . . 155
20.2.3 Fastening of the manure belt drive at the substructure . . . 156
20.2.4 Securing of the manure belt drive . . . 157
20.3 Assembly end set manure belt idler . . . 158
20.3.1 Accessories package for the return, supplemented with chain per tier . . . 159
20.3.2 Connection of the MB return to the section . . . 161
20.3.3 Assembly of the skeletal structure (left version) . . . 163
20.3.3.1 Component parts . . . 163
20.3.3.2 Screwing of individual parts . . . 164
20.3.4 Assembly of the idler unit . . . 166
20.3.4.1 General plan . . . 166
20.3.4.2 Assembly of the idler unit . . . 167
20.3.4.3 Assembly of the tension unit per tier . . . 169
20.3.5 Anchorage at the floor . . . 171
20.4 Assembly longitudinal belt return . . . 172
20.4.1 Component parts . . . 173
20.4.2 Screwing of individual parts . . . 174
20.4.3 Assembly of Rolle for the returning eggbelt 245 . . . 176
20.4.4 Assembly of idler unit . . . 177
20.4.5 Installing the tension shaft and detent pawl . . . 178
20.4.5.1 Note regarding fixing the chain wheels to the tension shaft . . . 178
20.4.5.2 Assembling the tension shaft and detent pawl with pin . . . 179
20.4.5.3 Assembly of the roller chain . . . 180
20.4.6 Connection to the section . . . 182
20.4.6.1 Connection to the stand . . . 182
20.4.6.2 Connection to manure belt drive . . . 184
20.5 Assembly connection longitudinal belt drive . . . 185
20.5.1 Connection set for longitudinal belt drive . . . 185
20.5.1.1 Components parts and screws for connection set l-b drive . . . 186
20.5.1.2 Connection to the section . . . 187
20.6 End-sets feeding . . . 188
20.6.1 Drive side . . . 188
20.6.1.1 Pre-assembly of feed column . . . 188
20.6.1.2 Screwing of feed troughs to the feed column . . . 189
20.6.1.3 Installation of the guide shoes and feed level slides . . . 190
20.6.2 Pre-assembly of the corners 90deg BD 2000 and corner supports . . . 191
20.6.3 Pre-assembly of the MPF drives to the feedtrough . . . 192
20.6.3.1 Assembling the pre-mounted components . . . 193
20.6.4 Assembly of the 1" pipes for supporting the feed column . . . 194

20.6.4.1 Cutting the pipes and assembling of plastic caps 194
20.6.4.2 Screwing the pipes to the corner supports 195
20.6.5 Assembly of the support for the MPF drives 196
20.6.6 Drive side 197
20.6.7 Assembly of water supply 198
21 Attaching the service board 199

1 Basic instructions

	Please take care of this manual and always keep it in the same place close to the installation for quick reference. All persons working with the system, assembling, cleaning and servicing it have to be familiar with the contents of these instructions. Please observe the contained safety instructions! If this manual gets damaged or lost, request a new copy from **Big Dutchman**.

1.1 Basics

The **Big Dutchman** installation has been constructed according to the current state of the art and all acknowledged regulations regarding technical safety. The installation is reliable. Upon operation, however, dangers to life and limb of the user or third persons or impairments of the system or other material property are still possible.

The system may only be mounted, attended, repaired und used:

- for due use
- in an excellent state from the safety and technical point of view
- by persons who are familiar with the safety regulations

In the event of special problems which are not described in detail in this manual, we recommend to contact us for your own safety.

1.2 Explaining the symbols

1.2.1 Safety symbols in this manual

Upon reading this **manual** you will come across the following symbols

	WARNING This symbol indicates risks possibly leading to personal injury resulting in death or to severe injuries.
	CAUTION This symbol indicates risks or insecure procedures possibly leading to injuries or material damage.
	NOTE This symbol indicates notes leading to an effective, economic and environmentally-conscious handling of the installation

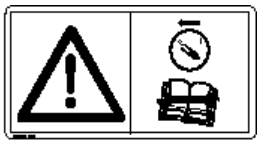
1.2.2 Safety symbols in the manual and on the installation

These safety symbols illustrate remaining dangers when handling the system. They are supplements to the above-mentioned symbols:

	Warning against dangerous electric tension
	Warning against the cold
	Warning against slippery surface

1.2.3 Safety symbols and notes on your installation

Depending on the type of installation you will find the following safety symbols. They indicate technically remaining dangers when handling the system and give information on how to avoid these dangers.

	**GENERAL DANGER !** Installation automatically starts working.Before starting repair, maintenance or cleaning work, put main switch to ”OFF”
	Danger of bruising due to rotating machine parts! Close protective devices each time before taking the system into operation.Opening protective devices is only allowed when the system is in a standstill. People have to be authorised for this.
	RISK OF INJURY due to operating auger, chain or cable discs! Never reach into or climb into a feed container or trough while the motor is running.
	DANGER OF SKIN CORROSION due to purifying agents! Always wear protective clothing when repairing, maintaining and cleaning the installation.Always observe the manufacturer’s instructions when using acids!

Implicitly observe the instructions attached to the installation, such as the arrow on the motor indicating the direction of rotation.

The signs and safety instructions always have to be visible and must not be damaged. If they are soiled by dust, manure, feed remains, oil or grease, clean them by means of a water-detergent mixture.

	If a safety symbol or instruction is fixed to a part to be replaced, ensure that it will be fixed to the new part as well.

1.3 Designated use

This installation has been built to produce eggs and to increase the birds' freedom to move. These aims define the designated use of the installation. The **Big Dutchman** installation may only be used according to its designated use. Every other use is considered as non-designated use. The manufacturer does not accept liability for damage resulting from other uses, the user alone has to bear the risk.

The designated use also includes the exact observance of the operation, maintenance and repair instructions as prescribed by the manufacturer..

1.4 General safety instructions

All established safety precautions and other generally accepted safety regulations and medical references have to be observed. Please check safety and function control devices to ensure safe and accurate operation:

- before putting into operation
- at adequate time intervals
- after modifications and repairs.

Check the proper functioning of the system after any kind of repair works. You may only take the device into operation, when all protective systems have been put into place again. Follow the directions of the electric and water supply company.

1.5 Safety instructions when operating electrical appliances

You have to make sure that the system with the electrical appliances is operated and maintained according to the electro-technical regulations.

Installations and work on the electric components/structural groups may only be carried out by qualified personnel according to electro-technical regulations (e.g. EN60204, DIN VDE 0100/0113/0160).

Dangerous electric tensions are bare in case of open control equipment. Please be aware of the danger and keep workers of other professions away from the dangerous spot!

Do not install control units directly in the house but in the service room in order to prevent damages due to ammonia vapours (NH_3).

Immediately switch off the installation in the event of malfunctions of the power supply units. Use a bipolar voltage probe to make sure that the electrical equipment is not alive.

Check the electrical wiring and cables for recognisable damage before putting the device into operation. Replace damaged wiring and cables before taking the device into operation.

Only use the fuses indicated in the circuit diagram. Immediately replace damaged fuses.

Warning

Never repair or bypass the fuses!

Damaged fuses have to be replaced with new fuses!

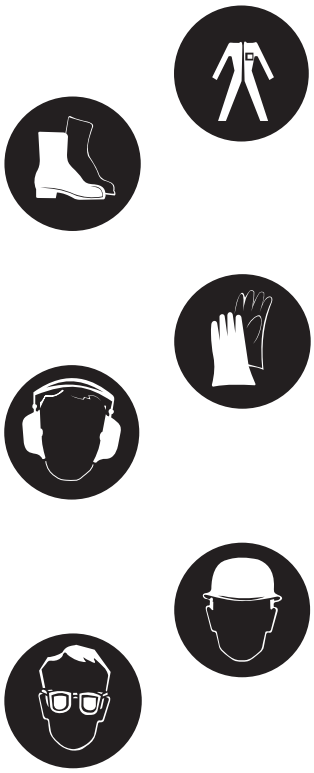
Never cover the electrical motor. This can cause high temperatures so that fire results and the working means can break down. The control box as well as the terminal and connector boxes of the installation must always be kept shut. Let damaged or broken plugs be replaced by an electrician. Let damaged or broken plugs be replaced by an electrician. For the respective connections please see the enclosed connecting plan of the system parts delivered.

1.6 Dangers resulting from non-compliance with the safety instructions

Non-observance of these instructions can cause severe danger for life and health of people or can lead to material or environmental damages and to the forfeiture of any claim for damages. To be precise, the non-observance of these instructions can lead to:

- Failure of vital functions of the installation
- Failure of prescribed maintenance methods
- Dangers for people owing to electrical and mechanical influences.

1.7 Clothing for personal safety



When operating, maintaining and cleaning the system, avoid wearing wide, fluttering clothes, rings and watches.

Make sure that long hair is tied back when approaching moving system parts. Hair can get caught in the parts in motion and thus create severe injuries.

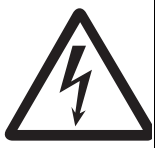
Wear protective clothes and safety footwear upon operating, maintaining and cleaning the system, if required also use a safety helmet, ear protection, safety glasses, protective gloves and gas mask..

1.8 Assembly and maintenance

Assembly of the system can be carried out by the operator himself or by an authorised person. We require that the operator or the authorised person possess the required knowledge and practical experience or technical training and qualification necessary for a proper assembly.

Repairs may only be carried out by persons who are competent and can guarantee proper handling because of special training or knowledge and practical experience with the unit. The operator has the sole power of decision. Work on the electric components may only be carried out by technically skilled personnel and under consideration of German Industry Standards, VDE regulations, safety instructions and electro-technical regulations of the power supply industry (EVU). Only work with appropriate tools; in case of possible danger to hands, use protective gloves, and safety glasses in case of danger to the eyes.

Repair, maintenance and cleaning operations as well as the removal of functional disorders may generally only be carried out when the installation is turned off and the power supply is disconnected.



Protect the installation by means of a sign fixed to the main switch reading ”Do not put into operation!” Refer to maintenance works in case of need.

Check the proper functioning of the system after any kind of repair or maintenance. You may only take the device into operation, when all protective systems have been put into place again.

1.9 Employing external personnel

Mounting, maintenance and repair work is frequently carried out by non-operating personnel, which is not familiar with the special circumstances and the inherent dangers

As supervisor, you are responsible for the safety of external personnel!

You as operator are to survey the personnel and to define responsibilities and powers. Inform these people in detail on the dangers of their area of work. Check their method of working and intervene as soon as possible.

1.10 Ordering spare parts

Operational safety is the prime necessity!

For your own safety only use original **Big Dutchman** spare parts. For foreign products that have not been released or recommended or for modifications carried out (e.g. software, control units) we cannot judge whether there is a safety risk in connection with the **Big Dutchman** systems.

You can find the exact description (Code No.) of the parts for ordering spare parts by means of the position numbers in the spare parts lists (see appendix).

Indicate the following for ordering spare parts:

- Code No. and description of the spare part or
- Invoice No. of original invoice
- Power supply e.g. 220/380V-3Ph.-50Hz

1.11 Obligations

Closely adhere to the instructions in this manual.

A basic condition for safe operation and trouble-free handling of this system is the knowledge of the basic safety instructions and regulations.

These mounting and operating instructions, particularly the safety instructions, have to be observed by everyone working with this system. Moreover, the regulations and instructions for the prevention of accidents valid at the respective place of use have to be observed.

The manufacturer is not responsible for any damages to the machine resulting from changes done by the user.

1.12 Warranty and liability

Warranty and liability claims regarding personal and material damage are excluded if they result from one or several of the following causes:

- non-designated use of the installation
- inappropriate mounting and operating of the system
- operating the system with defective safety equipment or not duly fixed or not functioning safety and protective devices,
- non-observance of the instructions in this manual regarding transport, stock keeping, mounting, maintenance, operating and upgrading of the system
- unauthorised modifications on the system
- inappropriate repairs
- in the event of disasters caused by foreign matters or force majeure.

1.13 Disorders due to power failure

We recommend the installation of warning systems for a better control of your production units or the use of an emergency power-generating set for supplying the system with power in case of power failure. By this, you protect the birds and thus your own economical health.

Emergency power units with universal transmission for connection to a tractor are also suitable. For further information please contact your property insurance.

1.14 First aid

For the case of an accident, unless specified otherwise, a first-aid kit must always be available at the place of work. Material taken out and used is to be replaced immediately.

If you need help, describe the accident as follows:

- where it happened
- what happened
- the number of persons injured
- what type of injury
- who is reporting the accident (your data)!

1.15 Waste disposal

After finishing the assembly or repair of this installation, dispose of the packing material and remains which do not need to be further used according to the legal provisions for recycling. The same applies to the component parts after putting the installation out of service.

1.16 Notes for use

We reserve the right to modify the construction and technical data for reasons of further development. Therefore, no claims can be derived from the information, pictures, drawings and descriptions. Subject to correction! In addition to the safety-relevant instructions in this manual and the safety precautions valid in the country of use, also observe the generally acknowledged technical regulations (safe and appropriate working according to UVV, VBG, VDE etc.). In addition to these operating instructions, please also observe the instructions supplied by the manufacturers (e.g.sensors).

1.17 Copyright

This manual is subject to copyright. The information and drawings included in this manual shall not be copied without the manufacturer’s consent, nor shall they be used for anything other than the designated use. Neither shall they be given to third parties.

The contents of this manual can be altered without prior notice.If you find mistakes or unclear information in this manual, please do not hesitate to let us know.

All trade marks mentioned or shown in the text are trade marks of their respective owners and are recognised as patented.

© Copyright 2007 by **Big Dutchman**

For further information please contact::

Big Dutchman International GmbH, P.O. Box 11 63, D-49360 Vechta, Germany,

Phone +49(0)4447/801-0, Fax +49(0)4447/801-237, Telex 25510 big d

e-mail: big@bigdutchman.de, Internet: www.bigdutchman.de

2 Special safety instructions

2.1 Personal safety instructions

These safety instructions are intended to make you familiar with all information regarding the system that are important for your safety and that of the system.

Maintenance may only be carried out by specially trained and briefed users

Keep with the safety instructions in this manual.

2.2 Clothing and procedures for personal safety

2.2.1 Clothing and footwear

- Wide, fluttering clothes increase the risk of an accident
- Wide pieces of clothing, ties, scarves etc. can get caught in the moving or rotating system parts.
- High heels are a safety risk
- If you stumble, you can knock against sharp-edged, moving or rotating system parts and get severely injured

	Secure wide, fluttering clothes or take them off! When working at or on the system, only wear slip-free footwear and safety shoes when replacing heavy system parts!

2.2.2 Jewellery

- Loose or large jewellery increases the risk of an accident
- The large or loose parts of jewellery can get caught in components of the installation

	Take off all jewellery, particularly necklaces, bracelets and rings!

2.2.3 Hair

- Long hair increases the risk of an accident.
- Long hair can get caught in moving or rotating system parts

	Secure long hair by tying it back or wearing a bandanna or cap!

2.3 System safety instructions

The different areas of the **Big Dutchman Colony 2+** laying nests are characterised by different types of construction.

There are several system parts that run out, rotate or slide that can increase the risk of an accident when you are unaware of the type of construction.

Therefore:

It is essential to take into consideration the following instructions during maintenance, repair or operation of the system!

2.3.1 Entire system

- Parts lying about on the system or around it can cause you to stumble or fall so that you can get injured by the constructional parts of the system.
- Ignorance of the constructional structure of the system can lead to injuries.
- Parts lying about in / on the components (e.g. in the feed trough, on the egg belt, in the nests etc.) can severely damage the system.

	After repair or maintenance work, never place any objects (e.g. spare parts, replaced parts, tools, cleaning implements etc.) in the accessible areas of the system or around it! Make sure that all loose or replaced parts have been removed from the system components **before** the system is taken into operation again! Make yourself familiar with the construction of the system in sufficient light! If this is not possible at site, get all available information on the remaining dangers in connection with this system! When working **under** the installation, always wear a safety helmet!

2.3.2 Individual components

2.3.2.1 Feeding system

- Rotating or sliding parts of the feeding system can lead to injuries!

	Always disconnect power supply before working on the feeding system, since it can start automatically if controlled by a timer! Never reach into the feed trough with running feed chain! Never reach into the rotating feed chain drives (always keep safety cover closed)! Never touch rotating or powered system parts. Never reach into open and rotating feed chain corners!

2.3.2.2 Water supply

- Leaky hoses, seals or nipple drinkers can cause water damage in the house and destroy the installation and electrical systems.
- Danger of electric shock
- Danger of short circuits

	First disconnect main power supply and then enter the house compartment! If you have to carry out maintenance, cleaning or repair work get the information beforehand, where the main electric switch is located. Put main switch to ”Off” and indicate maintenance or repair work by a sign fixed to the main switch! Immediately disconnect main water supply!

2.3.2.3 Egg collection system

- Rotating parts (drive rollers, guide rollers and idler rollers etc.) can lead to severe injuries!

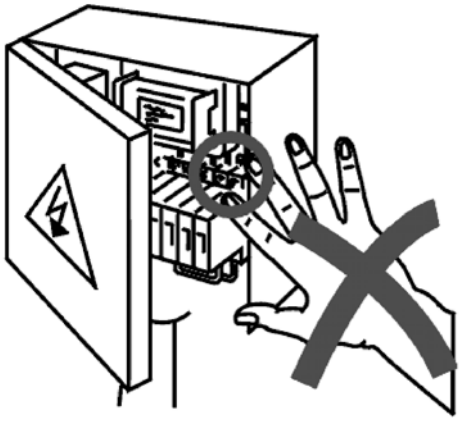
	Never touch drive, guide or idler rollers when the egg collection system is in operation! Make sure all covering caps or protection covers are properly closed and secured!

2.3.2.4 Manure removal

- Rotating parts (drive rollers, guide rollers and idler rollers etc.) can lead to severe injuries!
- Missing protective covers can lead to severe injuries.

	Never touch the driving, guide and deflection rollers when the manure collection is switched on! Make sure that all covers and protecting covers are duly closed and secured!

2.3.2.5 Electrical components



High electric tension!

If touching live parts, severe injuries due to electric shocks are possible!

During repair or maintenance work, live elements can be bare!

Never touch bare electrical components. Staff members must not use machines with bare electrical components.

2.3.2.6 Ventilation system

- Rotating fans can lead to severe injuries.
- Fans can start due to their automatic control units.

Never reach through the protective grills or blade flaps into a fan, even if it is not in operation!

Before carrying out repair or maintenance work, disconnect power supply and indicate this by a sign fixed to the main switch!

3 Management recommendations for Natura 60

3.1 Before and after the birds are moved in:

- Only use pullets reared in aviaries. Do not mix the flocks, no adding of birds reared in floor or cage managements.
- Pullets should be moved in at an early stage so that they can get used to the new house and the new environmental conditions. We recommend to move them in approx. 2 weeks before the first eggs are laid.
- Regulation of the start of the laying period only when a certain minimum feed consumption or a minimum weight of the laying hens is reached in order to guarantee a constantly high laying performance.
- Moving in of birds in 1st or 1st and 2nd manure belt level, NOT in the litter area, NOT in the upper movement area in front of the nest.
- No access to the litter area during the first days in order to ensure that the birds take in sufficient water and feed. Thus, the groups remain smaller and the danger of birds piling or getting crushed in corners is significantly reduced. The flock stays uniformly spread along the entire house.
- The feed troughs and drinking lines should already be filled when birds are moved in.
- Frequent feeding times throughout the day to encourage feed intake.
- The light should stay on to give the birds a better orientation when they are moved in. When birds are moved in in the evening, the light should be on for up to 24 hours.

3.2 Nest management

- The nest should be closed before the laying period starts in order to prevent the nests from getting dirty. The birds should not get used to resting in the nest but only to lay their eggs in there. Some days after the birds are moved in, the nests can be opened by the hour in order to let the birds "explore".
- During the daily house inspection always keep an eye open for the first eggs.
- As soon as the first egg is laid in the house, open the nests for the entire light-day.

- General rule for the opening and closing times of the nest from the beginning of the laying period on:
  - **open the nest 2 hours before the start of the light-day.**

    If miss laid eggs are increasingly found before the start of light-day, the nest opening time should be scheduled earlier. Otherwise, birds that are active before the start of the light-day are not able to go into the nest.

    It is no problem to open the nest 4 or more hours before the start of the light-day.
  - **close the nest ½ h before the end of the light-day.**

    Before the end of the light-day, the birds must have enough time to search for a resting place after they had to leave the nest.

    After having reached the max. laying performance, the nest can be closed earlier. Depending on the light program and the behaviour of the flock, the laying activity is already finished far before the end of the light-day and the nest can be closed. Thus, less dirt and dust is brought into the nests during the afternoon.

!	**Note:** **If the start of the light day is brought forward, make sure that the nest opening time is also scheduled earlier during the first weeks!**

- In order to increase the activity of the birds and consequently the nest acceptance, the drinker in the lower tier can be turned off in the first hours after the start of light-day, but **only after** the birds got used to the system. This encourages the hens to move towards the upper tier.

!	**Note:** **Always monitor water consumption. If it drops (and even if this happens only on one day) the lower drinker line has to remain open!**

3.3 Opening of the litter area

According to legal requirements, the birds must have access to the litter area. However, it is permitted to lock up the birds in the beginning in order to ensure water and feed supply.

Recommendation:

Access to the litter area approx. 2-3 weeks after having achieved 50 % laying performance in order to ensure that the hens visit the nest and not the litter area when starting to lay the eggs.

In the first days after the litter area has been opened for the first time, the hens possibly resting in the litter area must be returned to the system by hand after the start of the dark phase. This way, the birds will get used to the situation.

Note!

Hens sleeping on the house floor also prefer to lay eggs there!

For this reason it can be an advantage to close the wire grille of the litter area at night so that the birds are not able to return to the litter area. After a couple of days, the birds will return to the aviary on their own so that the wire grille can remain open for 24 hours each day.

If the wire grille is to be shut automatically at night, it has to be ensured that all birds are in the aviary otherwise they will have no access to feed, water and nests. Also, the litter area has to be re-opened in the morning.

3.4 Miss laid eggs on the tiers (system-eggs) and miss laid eggs in the scratching area (floor eggs)

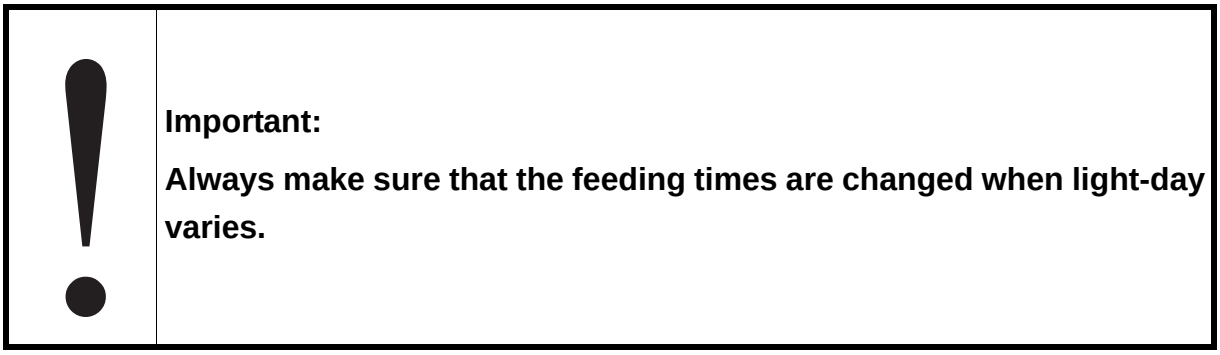
Since miss laid eggs roll out from the animal area, it is sufficient to collect eggs that were miss laid in the system once a day.

Only very few floor eggs are to be expected if the house management as described above is observed correctly. However, should there be an increased number of floor eggs, they have to be collected immediately and - if necessary - several times a day.

3.5 Feeding

When the laying phase has started, the daily feeding time has to be set as follows:

- first feeding immediately after the light is completely turned on;
- second feeding one hour after the first;
- third feeding approx. 5 hours after the second. This way, the birds won't be disturbed during the laying phase by a feed stimulus and the trough will be emptied once a day.
- additional feedings should be spread out evenly over the remaining light-day.
- The last feeding should take place 1 hour before the end of the light-day (approx. 15 min before the start of the dimming phase).



Important:

Always make sure that the feeding times are changed when light-day varies.

3.6 Drinkers

Set the water pressure to 350-400mm water column during the first days so that there are visible water drops at the nipples. Then, reduce the water pressure to 250-300mm water column.

3.7 Lighting

The main aspect of ideal illumination in an aviary house is the uniformity of the illumination. In order to be able to reduce the light intensity, e.g. if there is danger of cannibalism or feather picking, it should always be possible to dim the lights. It is always better to dim the lights than to turn off the individual lights, as with the second method, there are unwanted light-dark fields in the bird area. It would also be an advantage if all light rows were separately switchable and dimmable.

Basically there are two possibilities of lighting:

3.7.1 Lights both in the aisle area and in the system (below the manure belt levels) as well as a hose light in the "stairway" of Natura 60

We recommend the following light regulation:

In the morning:

1. At the start of the light-day, the lights above the litter aisles are slowly dimmed up or switched on followed by the system lights.
2. Then, the lights in the inspection aisle are switched on.
3. The hosel ight remains switched off.

In the evening:

1. First of all the lighting in the inspection aisle is turned off or dimmed. Then, (approx. 15-20min later) the light in the system and then the lights in the litter aisle are slowly dimmed and turned off.
2. The hose light is switched on approx. 15min before all the other light sources are turned off. It stays switched on for another approx. 15 minutes after the other light sources have been switched off and is then slowly dimmed and switched off.

   In a dark environment, this hose light **only** illuminates the entrance area as well as the "stairways" towards the sleeping places. This encourages even the last hens to return to the aviary before the light is completely turned off.

3.7.2 Lights only in the aisle area as well as a hose light in the entrance area of Natura 60

We recommend the following light regulation:

In the morning:

1. At the beginning of the light-day, first of all the aisle lights in the litter area are slowly dimmed up or switched on.
2. Then, (max. 20min later) the lights in the inspection aisle are dimmed up or switched on.
3. The hose light reminas off.

In the evening:

1. First of all, the lighting in the inspection aisle is switched off or dimmed down. Then (approx. 15-20min later), the lights in the litter area are slowly dimmed and turned off.

2. The hose light is switched on approx. 15min before all the other light sources are turned off. It stays on for another approx. 15min after the other light sources have been turned off and is then slowly dimmed and switched off. In a dark environment, the hose light only illuminates the entrance area as well as the "stairways" towards the sleeping places. This encourages even the last hens to return to the aviary before the light is completely turned off.

3.8 Flock control, daily monitoring

Right after the start of the light-day, the daily inspection of the technical equipment and the flock should take place. The following equipment has to be checked:

- drinkers
- feeding equipment
- lighting
- laying nest.r

The in-house climate has to be monitored and the condition of the flock and the behaviour of the individual hens has to be assessed. We recommend to carry out these inspections several times per day, especially at the beginning of the laying period.

3.9 Summary / figures related to practice

	when moving the birds in	**during the laying phase**
nest	closed	open at least 1h before "light on" close at least 1/2h before "light-off"
litter area	closed	open 24h
height of water column	35-40 cm	25-30cm
sunrise/sunset phase (total)	approx. 45 min	approx. 45min
feeding	several times per day	several times per day, but not during the laying phase
last feeding		15min before the start of the sunset phase

4 Operational safety and orders for spare parts

Operational safety is the prime necessity!

For your own safety only use original **Big Dutchman** spare parts. For foreign products that have not been released or recommended or for modifications carried out (e.g. software, control units) we cannot judge whether there is a safety risk in connection with the **Big Dutchman** systems.

We recommend the installation of warning systems for a better control of your production units. By this, you protect the birds and thus your own economical health.

In case of power failure, an emergency power-generating set should automatically supply the system with power.

Emergency power units with universal transmission for connection to a tractor are also suitable. For further information please contact your property insurance!

5 Recommended assembly order

These standard rules apply regarding the assembly order of the component parts:

1. from top to bottom
2. from the inside to the outside

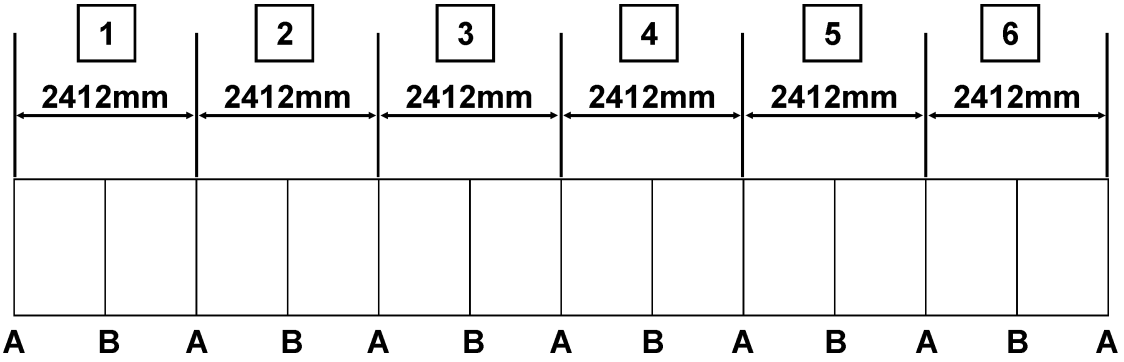
5.1 Assembly order of the components to be mounted

1. cage stands (may be pre-assembled on the ground)
2. side rails (erect carcass)
3. upper approach grid,
4. upper perch, roof wire rails and drinker lines
5. complete nest
6. bottom wire: central and bottom tier
7. feeding and perches (tubes)
8. egg channel
9. SST cover
10. sliding grid and folding grid
11. step rails behind nest
12. plywood panel in the scratching area
13. roof wire
14. end sets (manure belt drive and idler unit / longitudinal belt drive and idler unit)

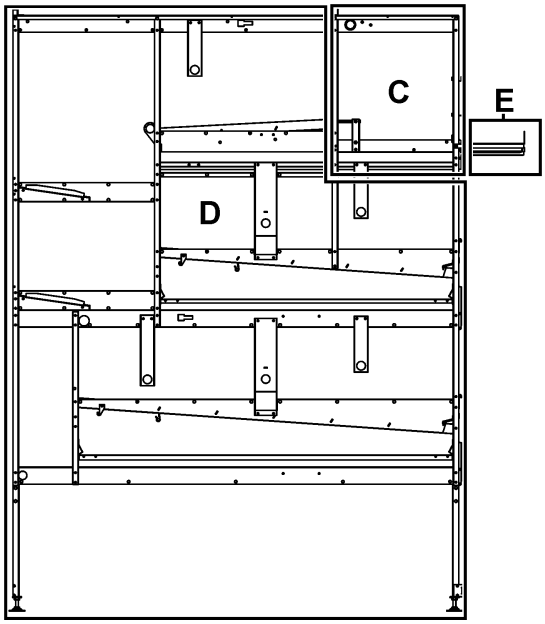
6 Assembling the stands

!	**Important:** For the assembly of the cage stands a distinction has to be made between a cage stand located at the beginning / end of a section **(A)** and a cage stand placed in the centre of a section **(B)**. Both type of cage stands may be completely preassembled on the ground. In the following, the cage stand at the **beginning / end of a section will be denominated "cage stand 2412"** and the cage stand at the **centre of a section will be denominated "cage stand 1206"**.

6.1 Positions of the cage stands 2412 and 1206 in a row



1-6 = number of sections	**A=** cage stand 2412
	B= cage stand 1206



C= nest area

D= activity zone, feeding and drinking zone of the birds

E= egg collection area

6.2 Pre-assembly of the stand foot extensions

For cage stand 1206:

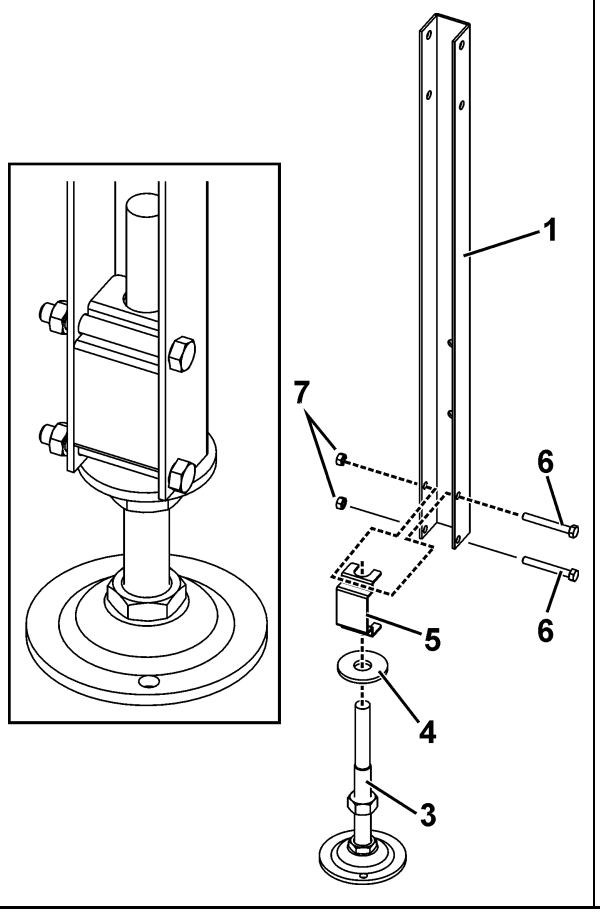
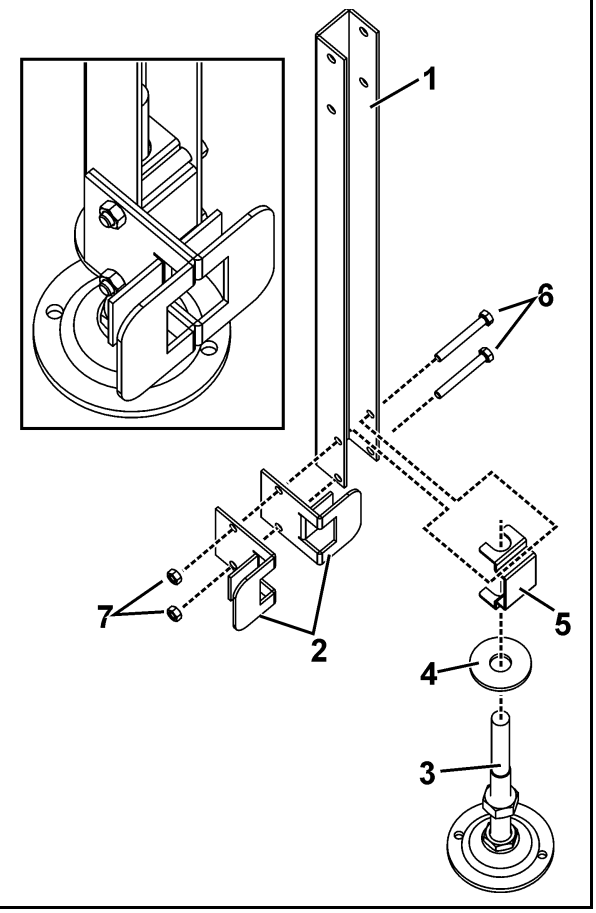
Both feet of the cage stand are assembled in the same manner without "supporting angle for plate".

For cage stand 2412:

At the feet extensions beneath the nest additional "supporting angles for plate NAT-60" have to be mounted. The other side has to be assembled without supporting angles.

At the **beginning / end of a row**, only **one "supporting angle for plate"** is screwed to the foot extension of "cage stand 2412".

At the "cage stand 2412" **within a row**, **2 supporting angles** each are screwed to the stand.

without supporting angles	with additional supporting angles
	

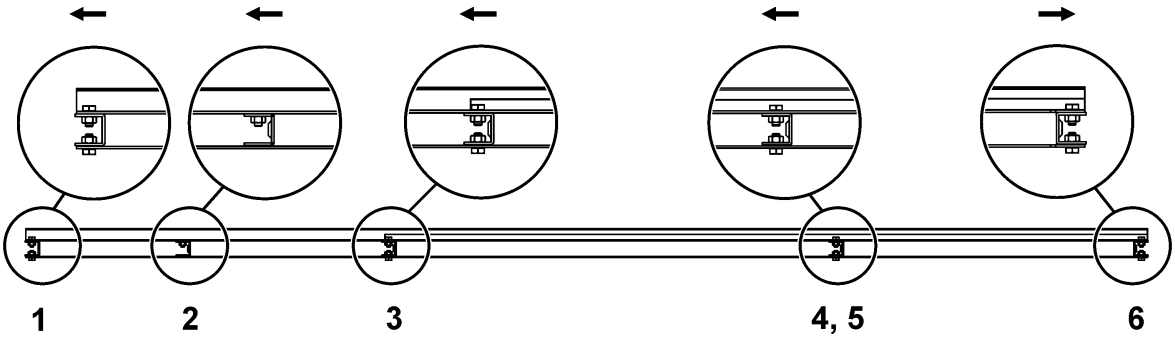
Pos.	Qty.	Code no.	Description
1	1	83-03-9699	post SST 900mm for holding plate NAT-60
2	1(2)	83-03-9698	supporting angle for plate NAT-60
3	1	37-97-4317	foot adjustable M12x140 PA/SST cpl.
4	1	99-20-1609	washer A 13.0x37x3.0 DIN 9021 SST

Pos.	Qty.	Code no.	Description
5	1	83-03-9793	holding plate SST for main post NAT-60
6	2	99-10-3824	hexagon head screw M 5x 40 galv. DIN 558
7	2	99-10-1023	hexagon nut M 5 galv. DIN 934-8

6.3 Alignment of the posts of the cage stands 2412 and 1206

The arrows in below drawing indicate the direction into which the open side of the respective U-post has to point.

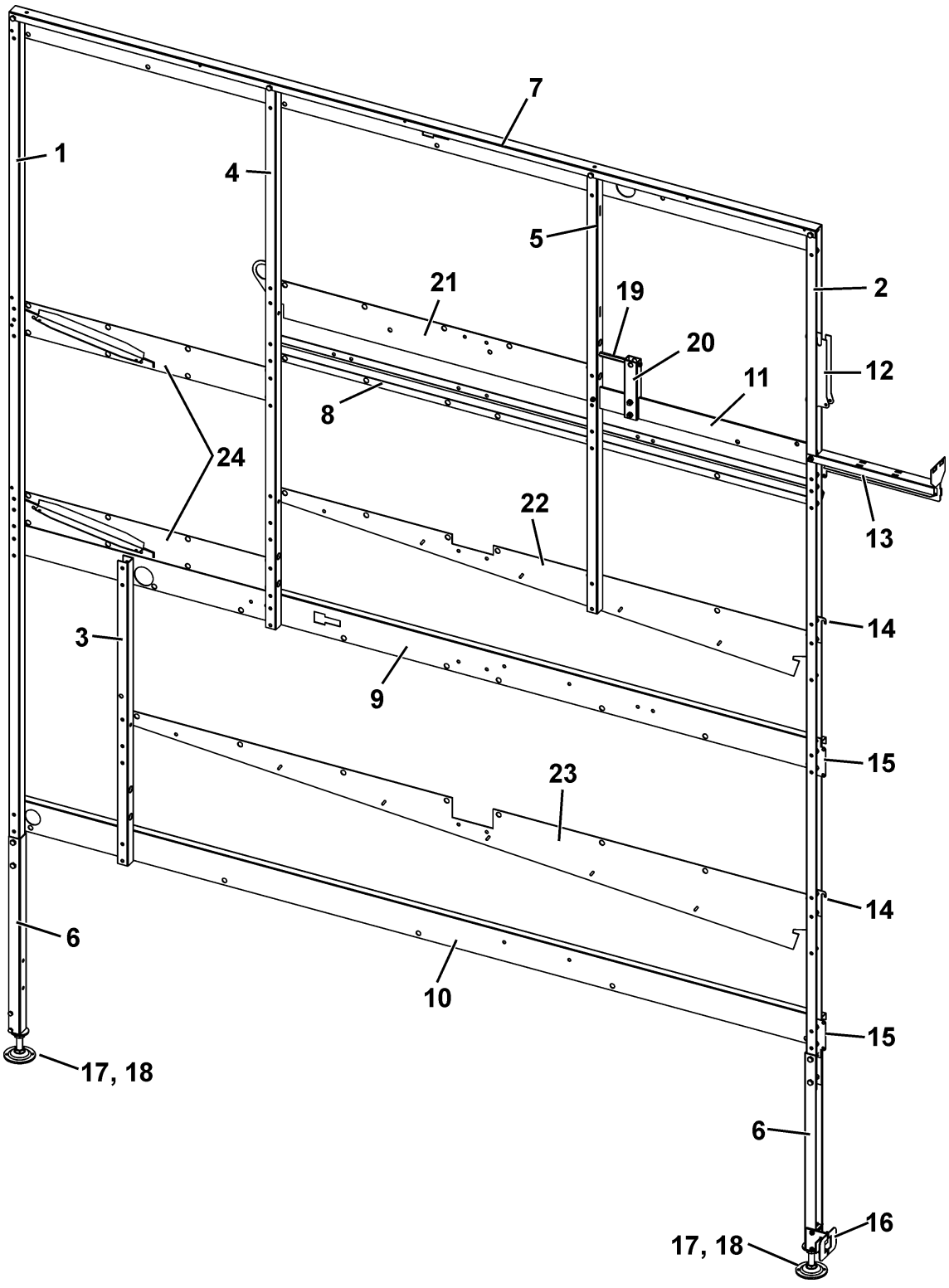
Top view:



Pos.	Qty.	Code no.	Description
1	1	83-03-9708	post staircase NAT-60
2	1	83-03-9706	post MB level lower NAT-60 BD-C2+
3	1	83-04-3257	post MB level centre NAT-60 BD-C2+
4	1	83-04-3258	post in front of nest 2412 NAT-60
5	1	83-03-9719	post in front of nest 1206 NAT-60
6	1	83-04-3262	post feeding side NAT-60

6.4 Assembly of the cage stands 2412

6.4.1 Overview individual parts cage stand 2412 (beginning / end of a section)



position numbers: see next page

Pos.	Qty.	Code no.	Description
1	1	83-03-9708	post staircase NAT-60
2	1	83-04-3262	post feeding side NAT-60
3	1	83-03-9706	post MB level lower NAT-60 BD-C2+
4	1	83-04-3257	post MB level centre NAT-60 BD-C2+
5	1	83-04-3258	post in front of nest 2412 NAT-60
6	2	83-03-9699	post SST 600mm for holding plate NAT-60
7	1	83-03-9705	cross member upper NAT-60-1800
8	1	83-04-3261	cross connector lower tier in front of nest NAT-60-1800
9	1	83-03-9704	cross member MB-level 1200 NAT-60-1800
10	1	83-03-9703	cross member MB-level 1540 NAT-60-1800
11	1	83-03-9685	cross member under nest bottom NAT-60-C2+
12	1	83-03-9696	fastening f/footrail collaps. for nest NAT-60 BD-C2+
13	1	83-03-9693	support for egg channel LB245 nest NAT-60 BD-C2+
14	2	83-03-9808	fastening hook for feed trough pluggable NAT-60
15	2	83-03-9807	guide f/wire of sliding front at feeding side NAT-60
16	1(2)	83-03-9698	supporting angle for plate NAT-60
17	2	37-97-4317	foot adjustable M12x140 PA/SST cpl.
18	2	99-20-1609	washer A 13.0x37x3.0 DIN 9021 SST
19	1	99-10-4052	spacer M 5x60 (118x60)
20	1	83-03-9695	bearing for bottom of nest NAT-60 BD-C2+
21	1	83-03-9716	cross connector lower tier in front of nest NAT-60-1800
22	1	83-04-3259	extension separating wire mesh MB-level 1200 NAT-60-1800
23	1	83-04-3260	extension separating wire mesh MB-level 1540 NAT-60-1800
24	1	83-03-9688	sheet metal galv. for cover SST NAT-60

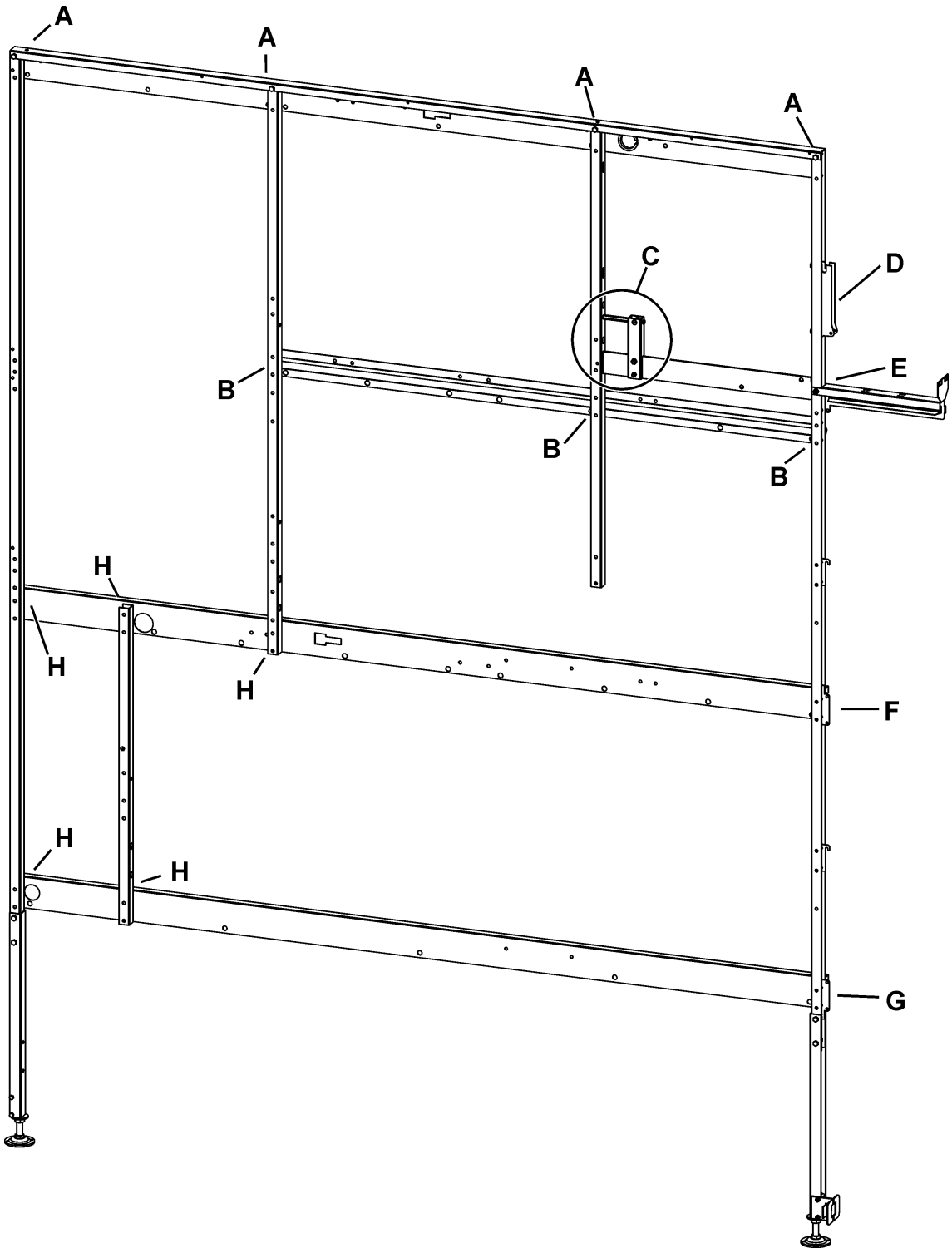
reg. position 16:

At the **beginning / end of a row**, only **one "supporting angle for plate"** is screwed to the foot extension of "cage stand 2412".

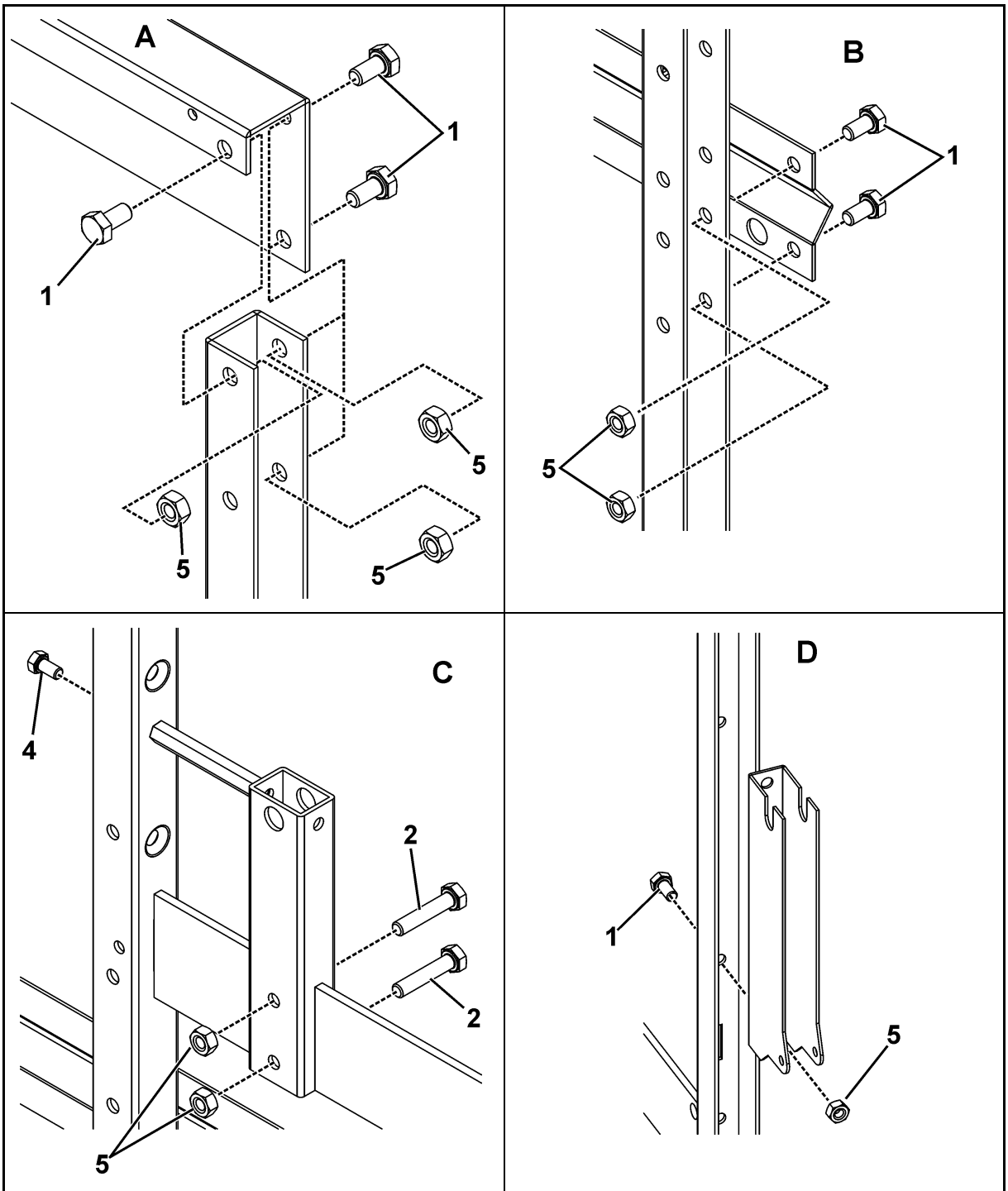
At the "cage stand 2412" **within a row**, **2 supporting angles** each are screwed to the stand.

6.4.2 Overview individual parts cage stand 2412 (beginning / end of a section)

Overall layout (posts, cross members and nest floor bearing):



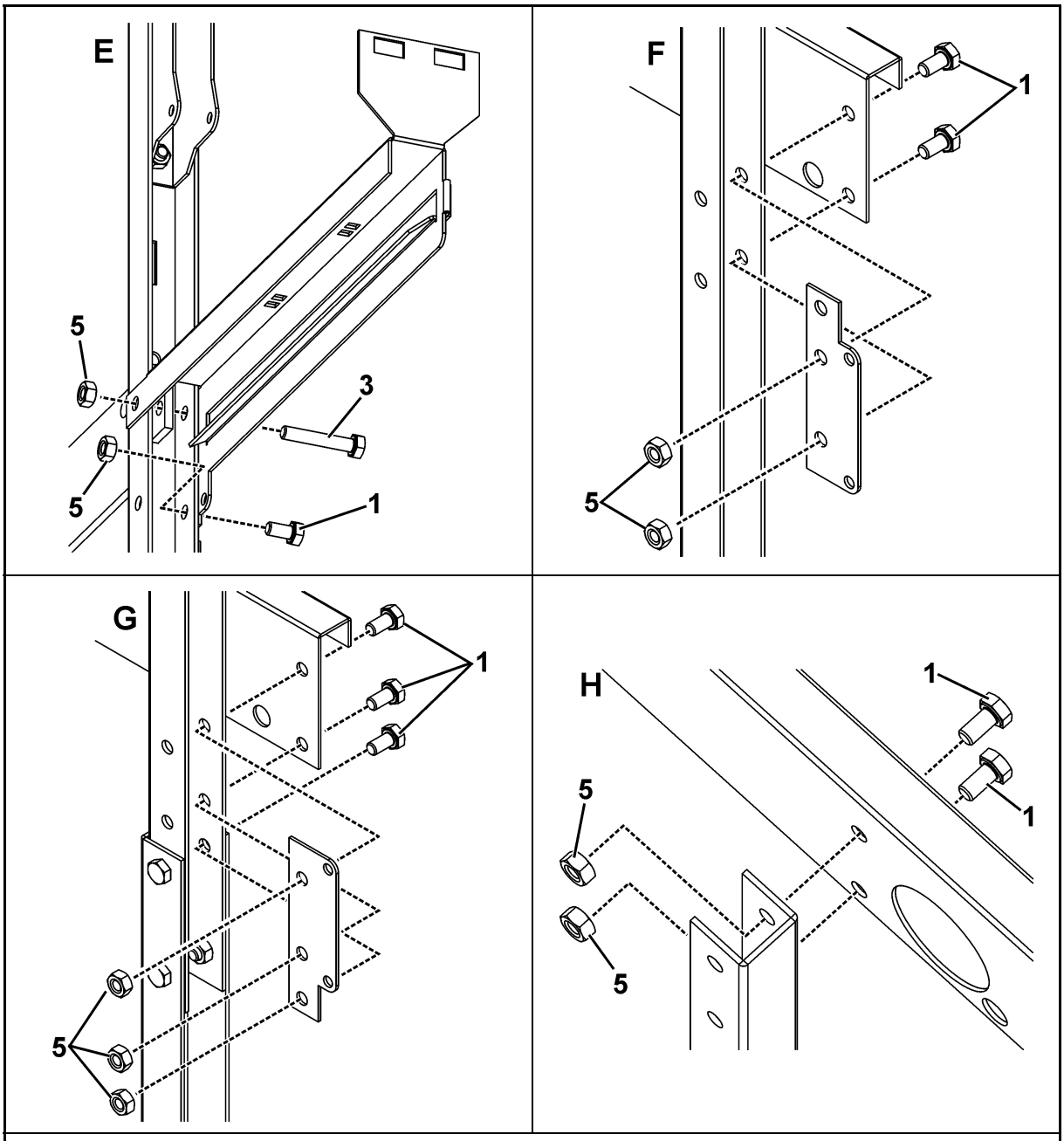
Details of positions A-H: see next pages



Reg. detail C:

The "distance pipe for nest floor bearing" has an **inside thread**. The tube has to be screwed to the post by means of a hexagon head screw M5x40 (4).

For position numbers: see page 32



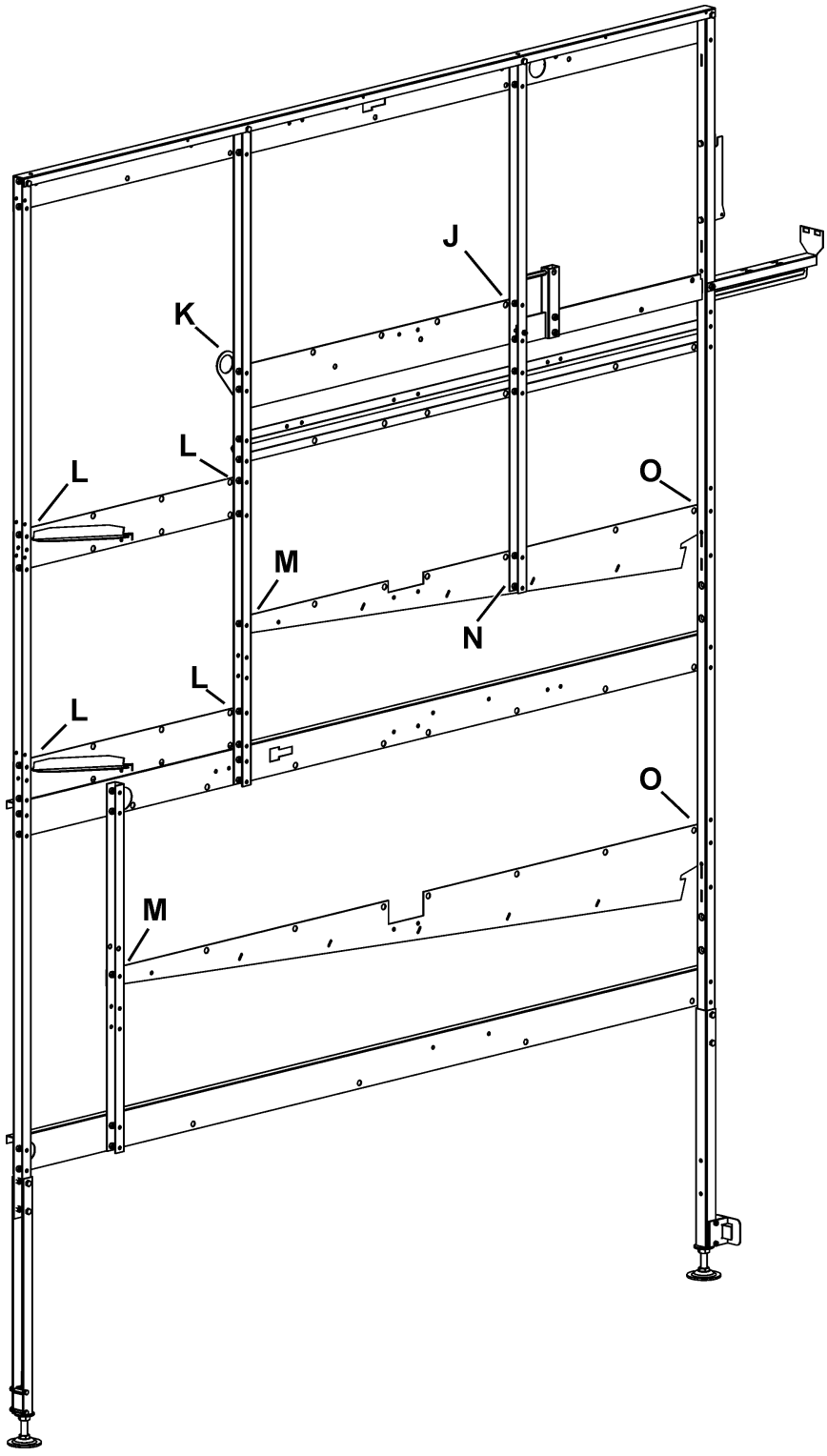
Reg. detail E:

The "support for egg channel" and the "cross member under nest bottom NAT-60 BD-C2+" have to be screwed to the post using the upper bore hole, by means of a hexagon head screw M6x35 (3).

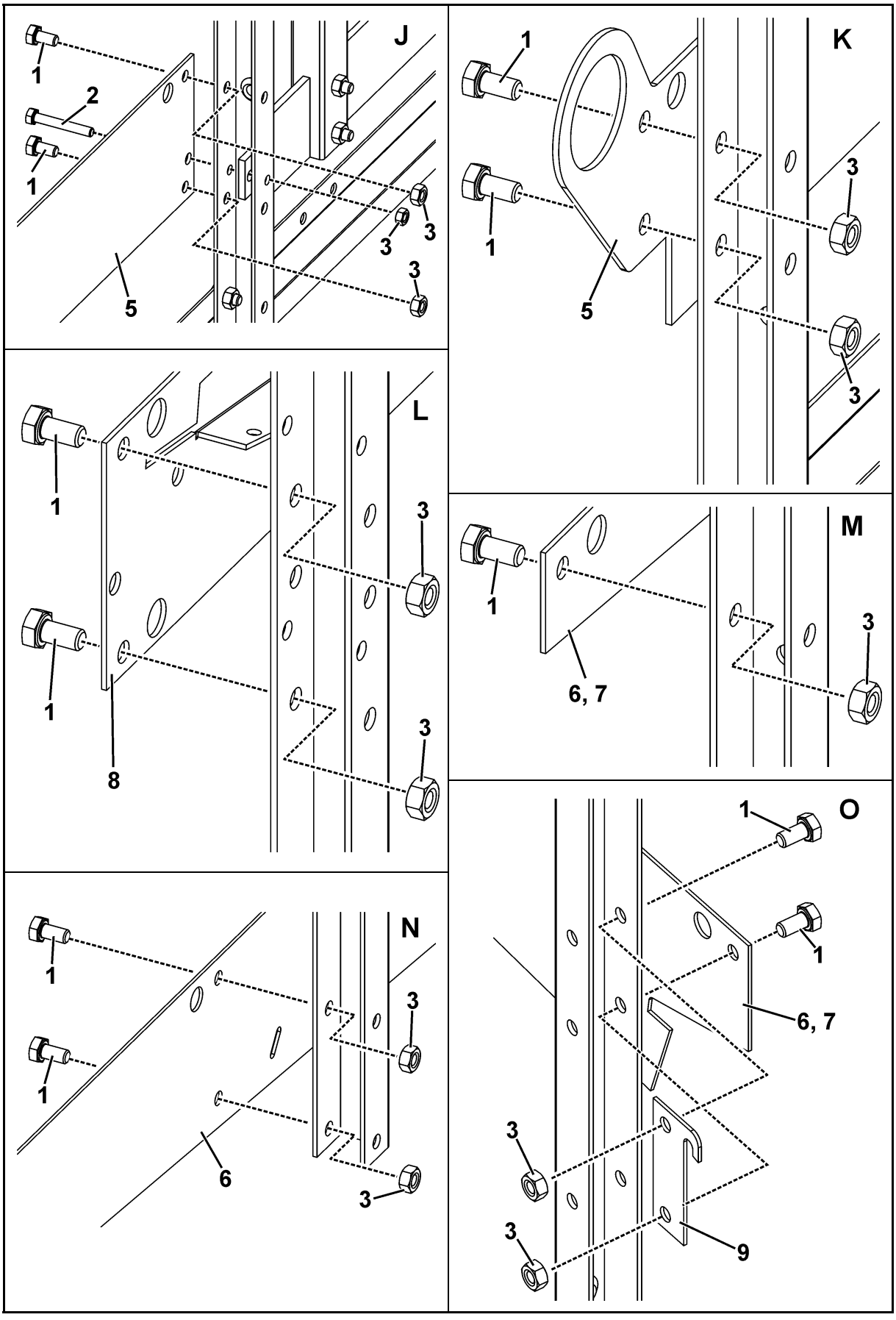
Pos.	Qty.	Code no.	Description
1	40	99-10-1100	hexagon head screw M 6x12 galv. DIN 933 8.8
2	2	99-10-1257	hexagon head screw M 6x30 galv. DIN 558
3	1	99-10-1376	hexagon head screw M 6x35 galv. DIN 931-8.8
4	1	99-10-1376	hexagon head screw M 5x 10 galv. DIN 933-8.8
5	43	99-10-1045	hexagon nut M 6 galv. DIN 934-8

6.4.3 Screwing of the separating wire mesh extensions and sheet metal for cover

General plan:



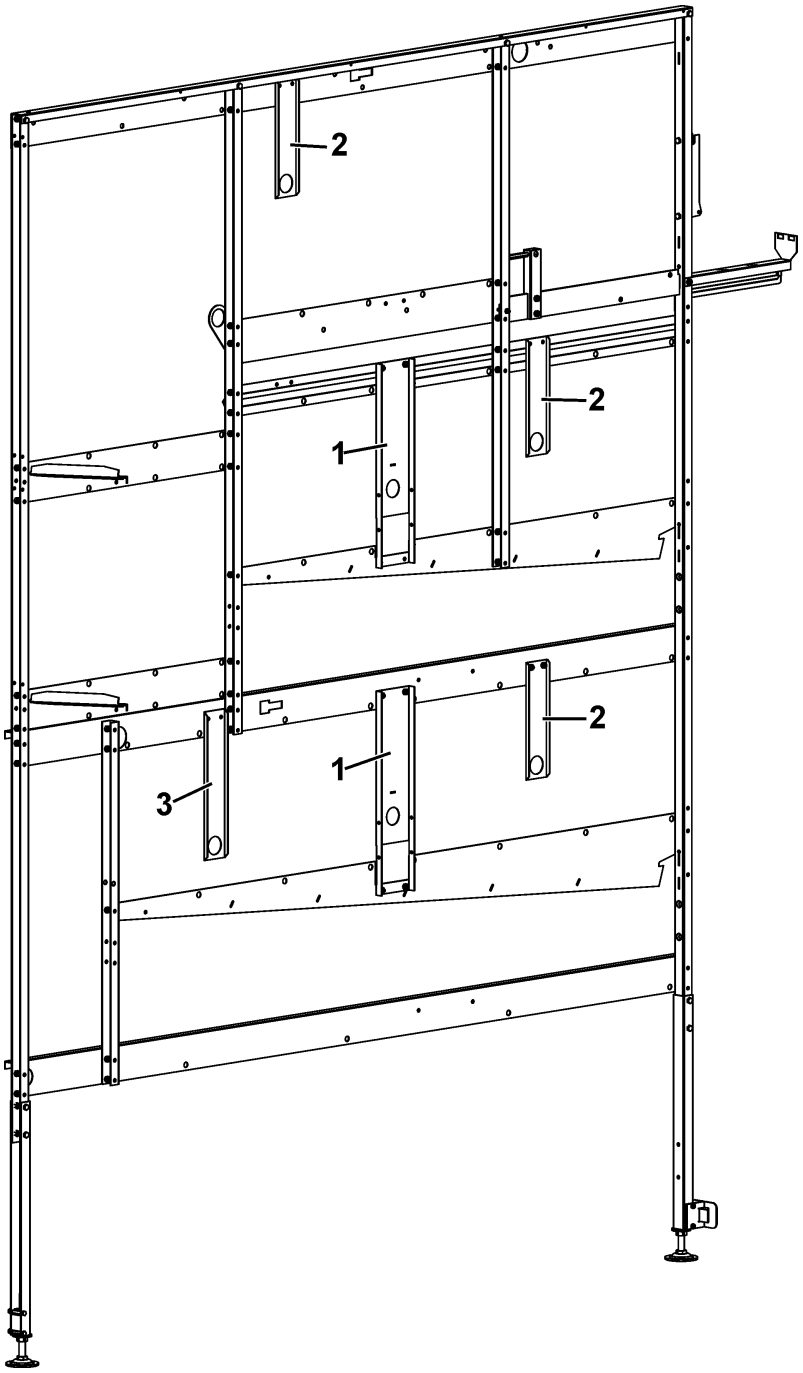
Details J-O: see next pages



For position numbers: see page 35

Pos.	Qty.	Code no.	Description
1	20	99-10-1100	hexagon head screw M 6x12 galv. DIN 933 8.8
2	1	99-10-1420	hexagon head screw M 5x 35 galv. DIN 558
3	20	99-10-1045	hexagon nut M 6 galv. DIN 934-8
4	1	99-10-1023	hexagon nut M 5 galv. DIN 934-8
5	1	83-03-9716	cross connector lower tier in front of nest NAT-60-1800
6	1	83-04-3259	extension separating wire mesh MB-level 1200 NAT-60-1800
7	1	83-04-3260	extension separating wire mesh MB-level 1540 NAT-60-1800
8	1	83-03-9688	sheet metal galv. for cover SST NAT-60
9	2	83-03-9808	fastening hook for feed trough pluggable NAT-60

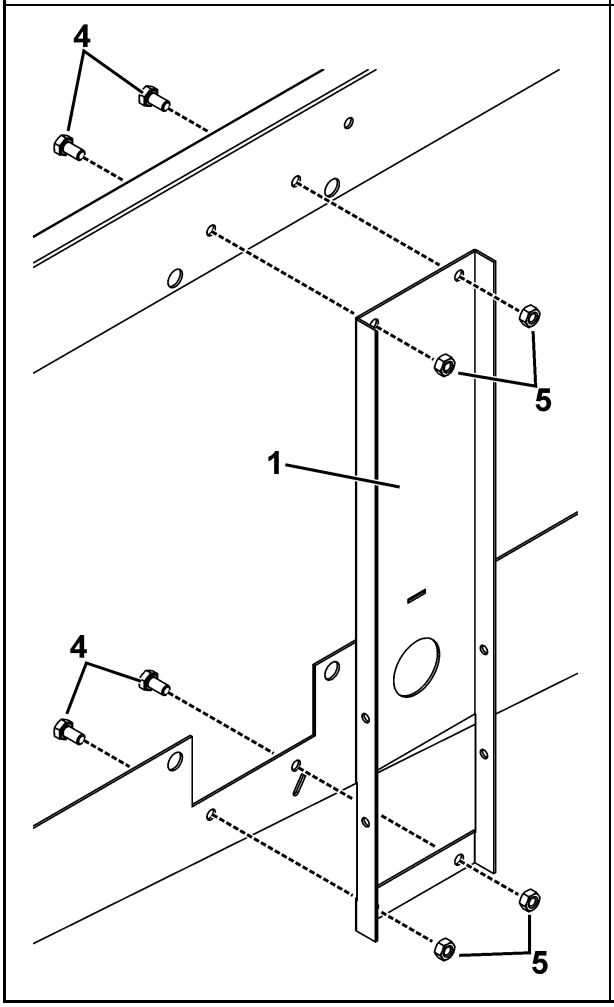
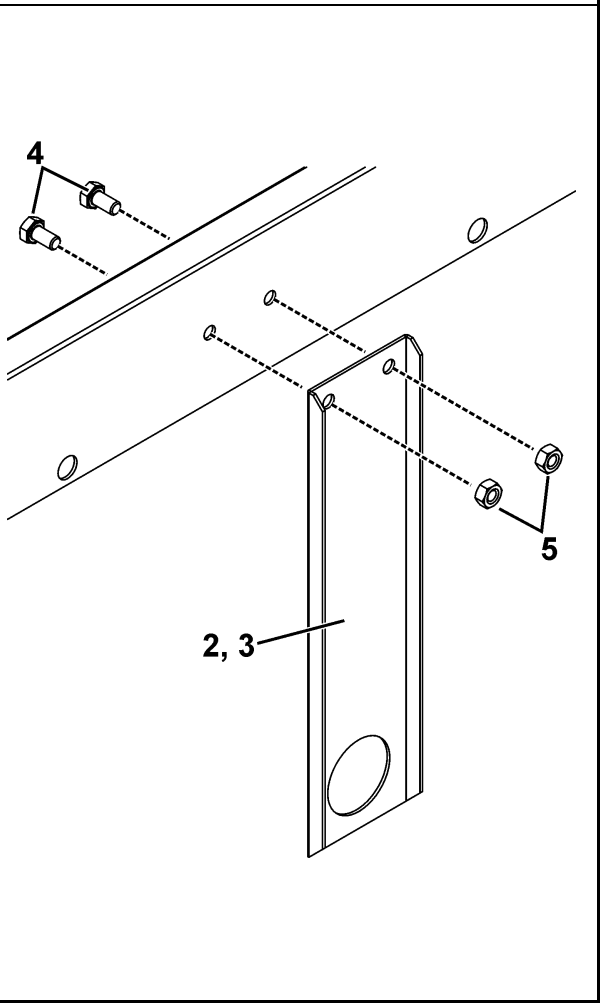
6.4.4 Assembly of the suspension material for feed trough and tube



details: see the following page

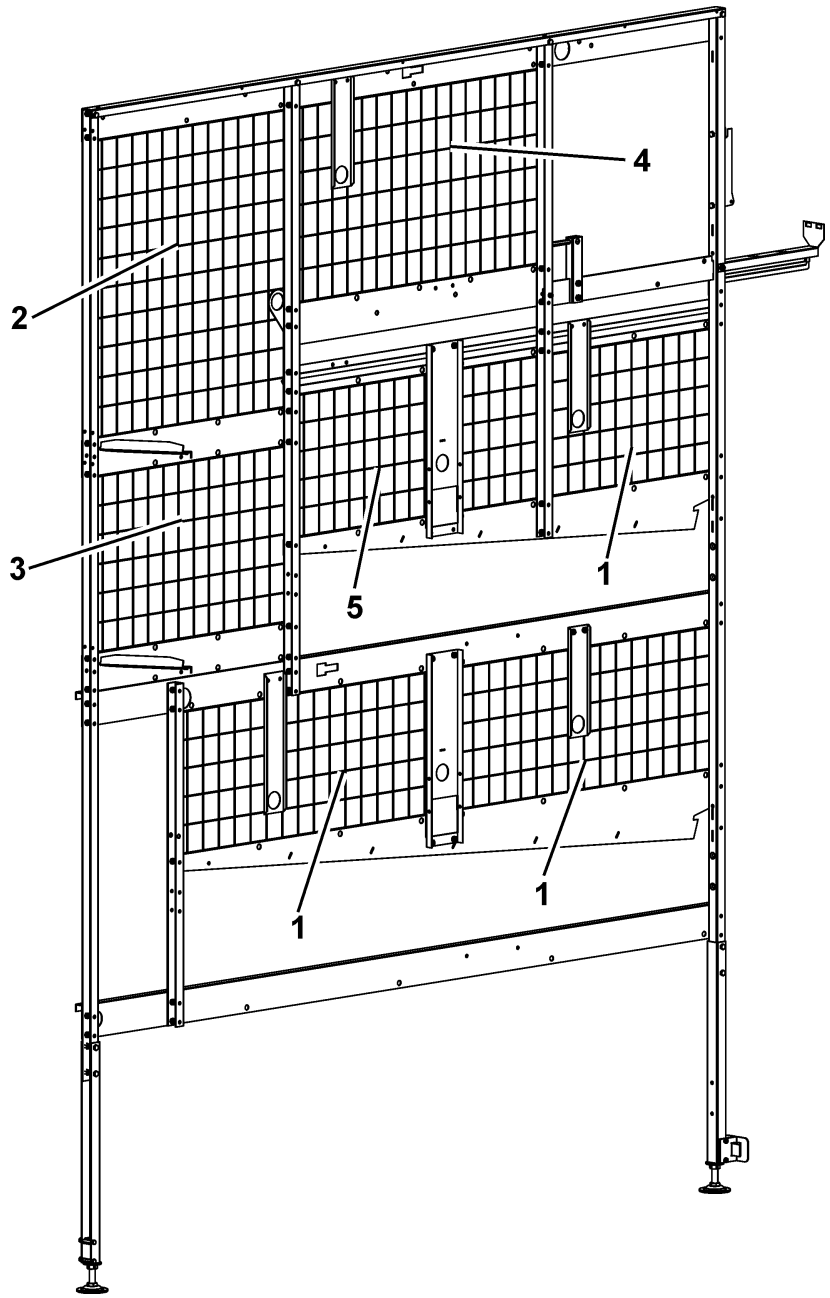
Pos.	Qty.	Code no.	Description
1	2	83-03-9714	suspension 405-61/50 for feed trough& 1x tube 33.3 / V-profile NAT-60
2	1	83-03-9713	suspension 233 for 1x perch NAT-60
3	3	83-03-9692	suspension 295 for 1x perch NAT-60

6.4.4.1 Screwing of the suspension material for the feed trough and for the perches

Suspension for feed trough	Suspension for perch
	

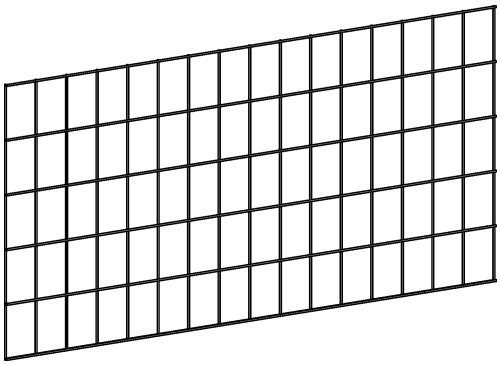
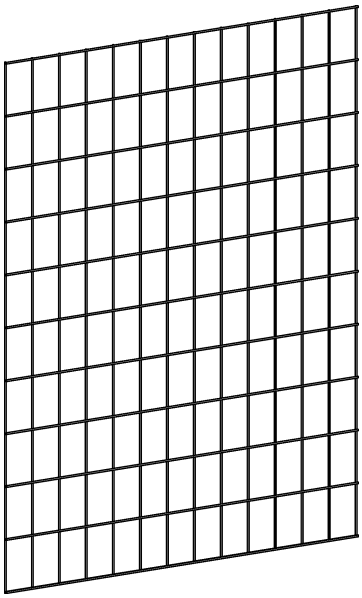
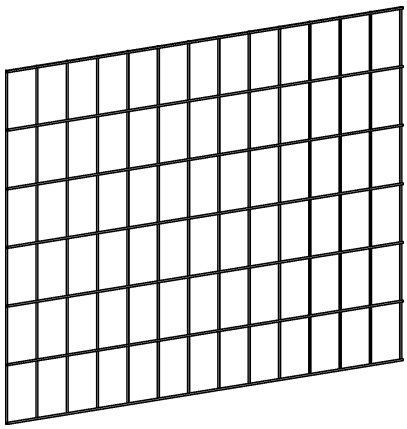
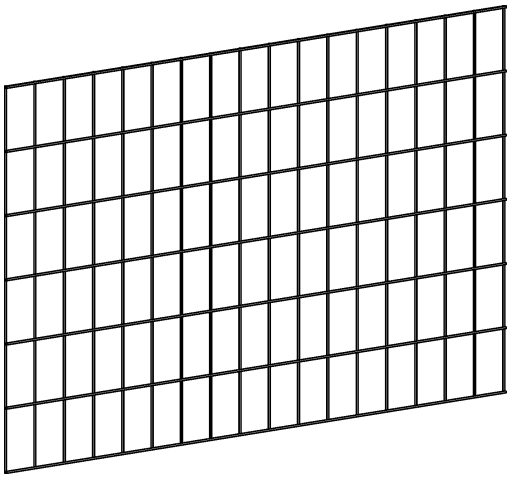
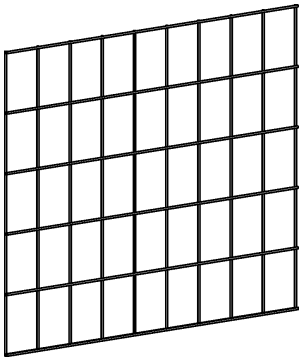
Pos.	Qty.	Code no.	Description
1	2	83-03-9714	suspension 405-61/50 for feed trough& 1x tube 33.3 / V-profile NAT-60
2	3	83-03-9713	suspension 233 for 1x perch NAT-60
3	1	83-03-9692	suspension 295 for 1x perch NAT-60
4	16	99-10-1100	hexagon head screw M 6x12 galv. DIN 933 8.8
5	16	99-10-1045	hexagon nut M 6 galv. DIN 934-8

6.4.5 Assembly of the separating wire mesh

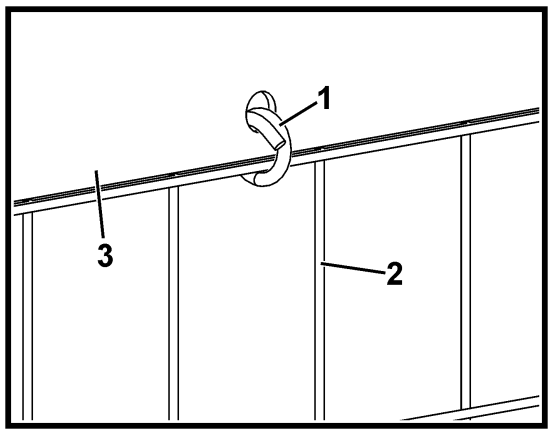


Pos.	Qty.	Code no.	Description
1	3	83-03-9684	separating wire mesh large next to feed trough normal NAT-60-1800 (ZnAl)
2	1	83-03-9686	separating wire mesh upper for staircase NAT-60 (ZnAl)
3	1	83-03-9689	separating wire mesh lower for staircase NAT-60 (ZnAl)
4	1	83-03-9690	separating wire mesh level in front of nest NAT-60-1800 (ZnAl)
5	1	83-03-9691	separating wire mesh small next to feed trough normal NAT-60-1800 (ZnAl)
6	57	37-00-0035	wire ring automatic / true ring Galfan

6.4.5.1 Detail views separating wire mesh

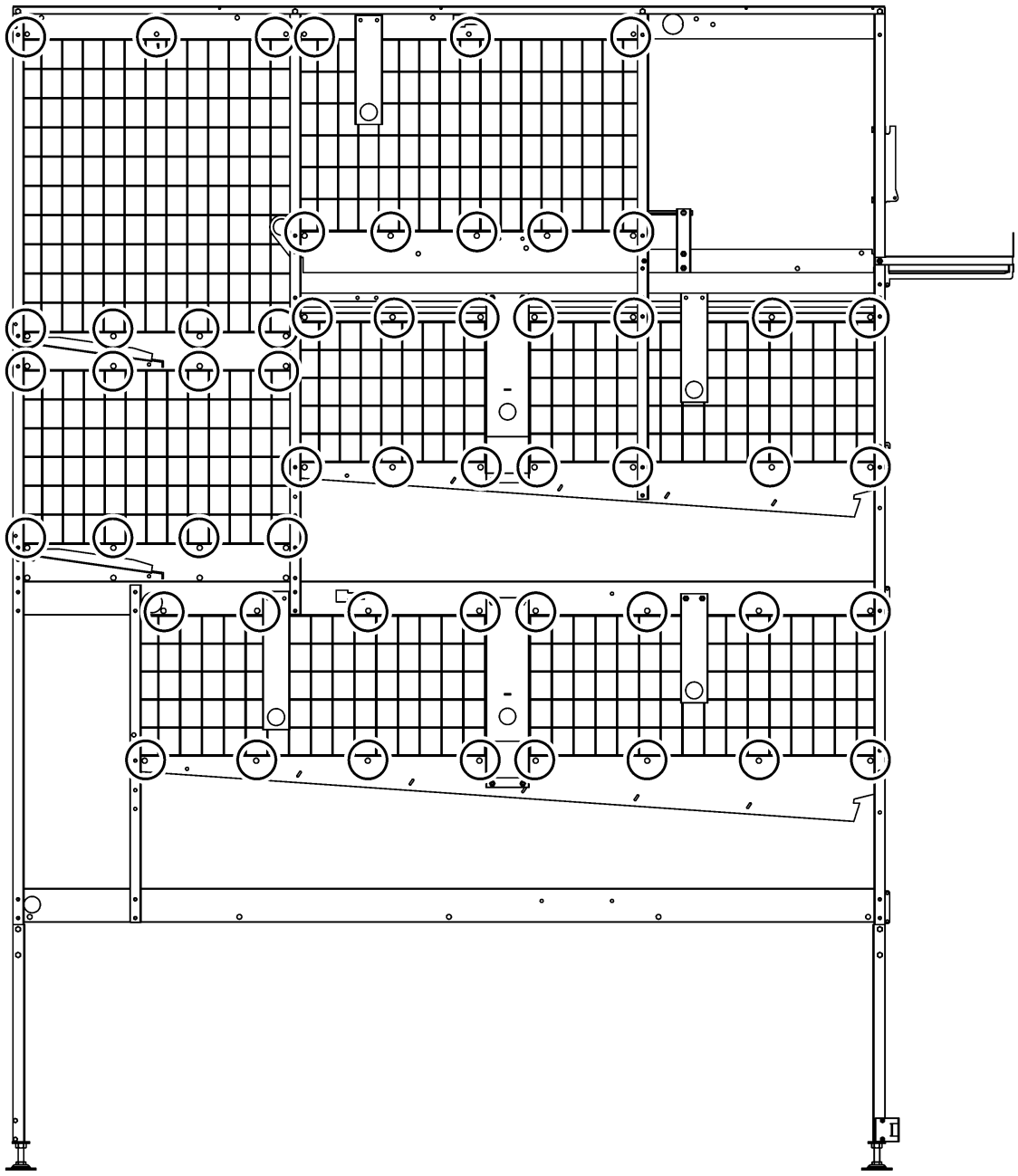
pos.1: sep. wire mesh next to feed trough	pos.2: separating wire mesh upper stairs
	
pos.3: separating wire mesh lower stairs	**pos.4: separating wire mesh nest level**
	
pos.5: separating wire mesh small next to feed trough	
	

6.4.5.2 Fastening of the wire meshes



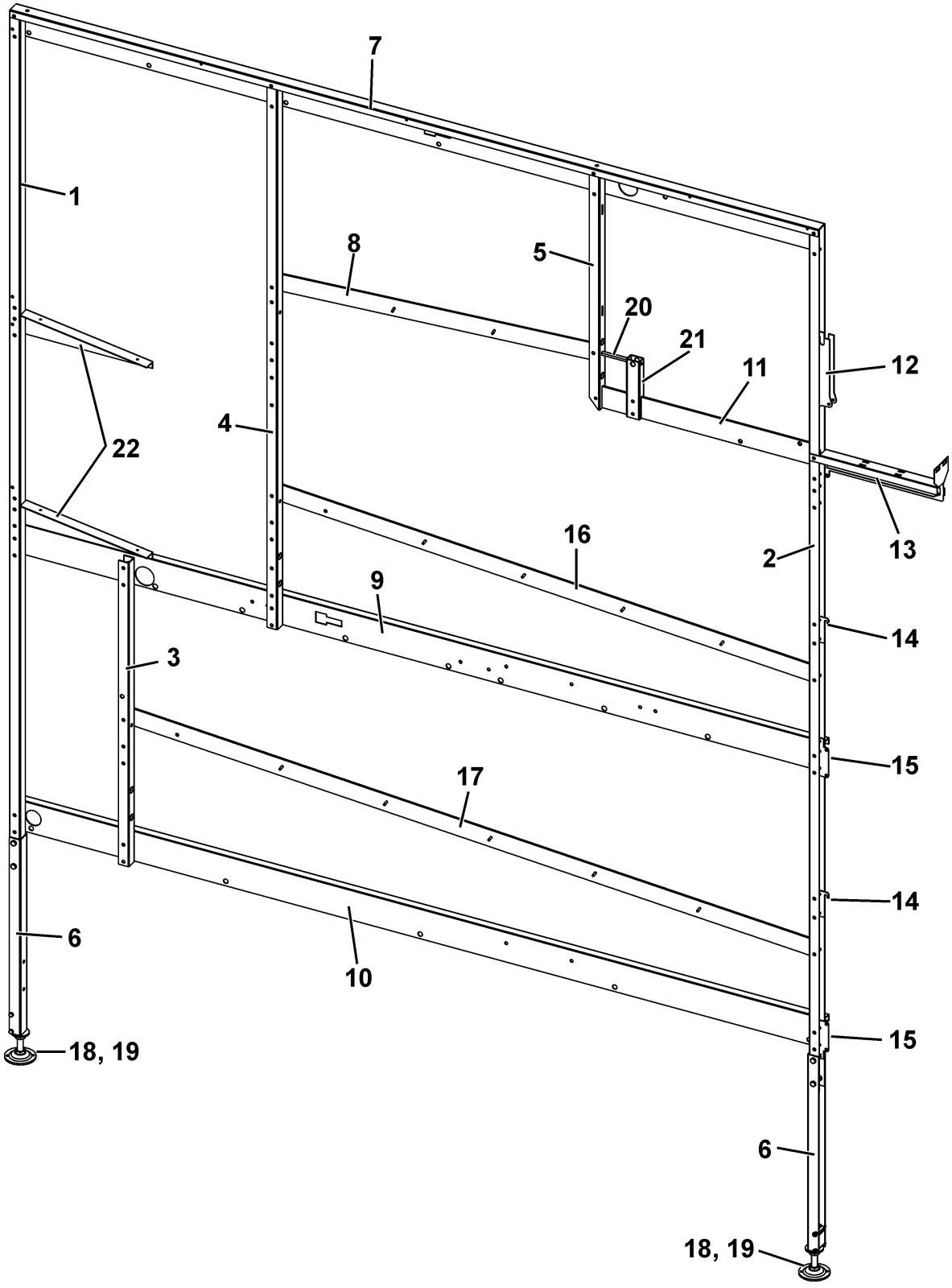
The encircled points in below drawing show the positions where each separating wire mesh (2) has to be fixed to the respective cross building part by means of a "wire ring automatic/True-ring" (1).

53 wire rings have to be mounted.



6.5 Assembly cage stand 1206 (centre of section)

6.5.1 Assembly cage stand 1206 (centre of section)



position numbers: see next page

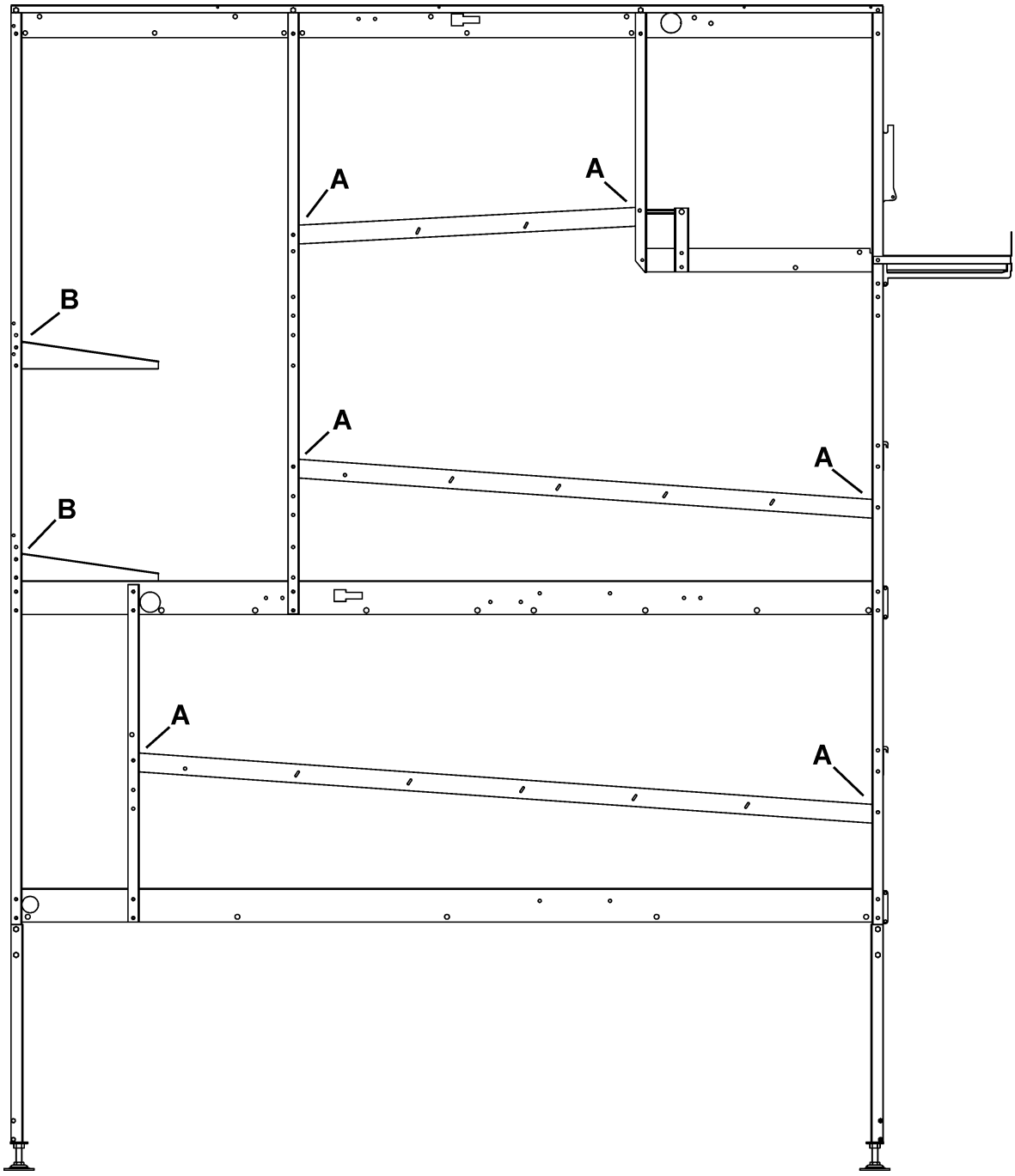
for positions 15:

	Please observe the different alignment of the "guide for wire of sliding front . (see also chapter 6.4.2 / Details F and G.

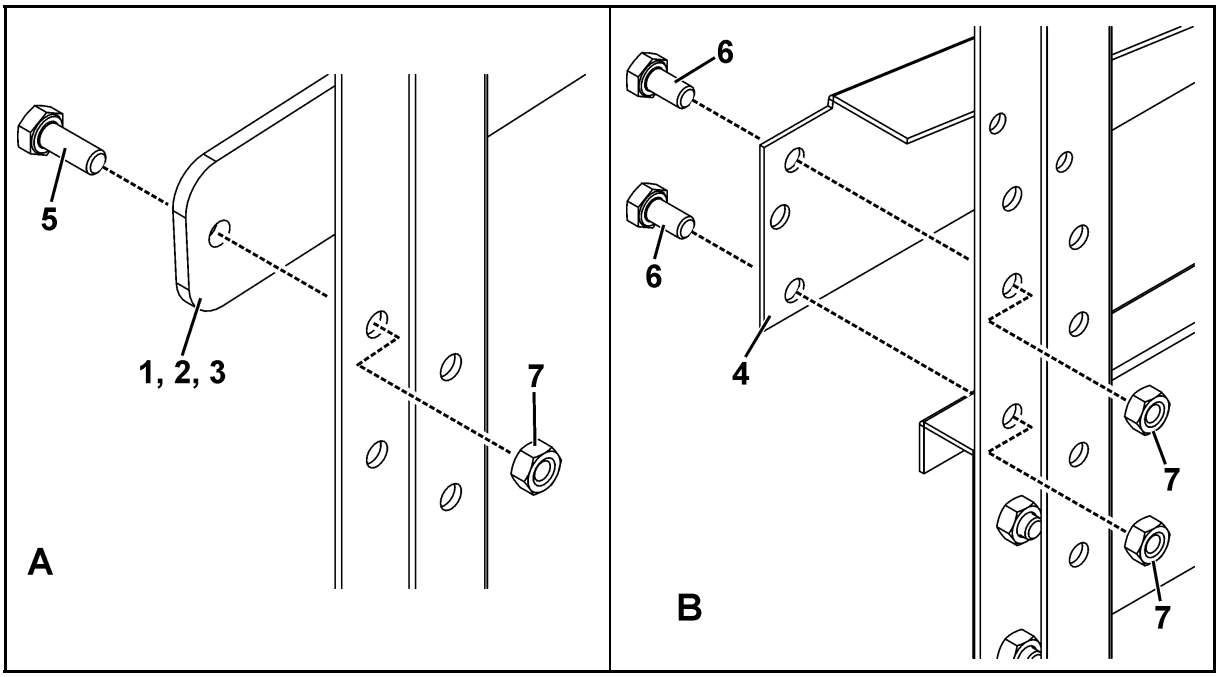
Pos.	Qty.	Code no.	Description
1	1	83-03-9708	post staircase NAT-60
2	1	83-04-3262	post feeding side NAT-60
3	1	83-03-9706	post MB level lower NAT-60 BD-C2+
4	1	83-04-3257	post MB level centre NAT-60 BD-C2+
5	1	83-04-3258	post in front of nest 2412 NAT-60
6	2	83-03-9699	post SST 600mm for holding plate NAT-60
7	1	83-03-9705	cross member upper NAT-60-1800
8	1	83-03-9720	support approach grating / level in front of nest NAT-60-1800
9	1	83-03-9704	cross member MB-level 1200 NAT-60-1800
10	1	83-03-9703	cross member MB-level 1540 NAT-60-1800
11	1	83-03-9685	cross member under nest bottom NAT-60-C2+
12	1	83-03-9696	fastening f/footrail collaps. for nest NAT-60 BD-C2+
13	1	83-03-9693	support for egg channel LB245 nest NAT-60 BD-C2+
14	2	83-03-9808	fastening hook for feed trough pluggable NAT-60
15	2	83-03-9807	guide f/wire of sliding front at feeding side NAT-60
16	1	83-04-3265	support for bottom wire grille MB-level 1200 NAT-60-1800
17	1	83-04-3264	support for bottom wire grille MB-level 1540 NAT-60-1800
18	2	37-97-4317	foot adjustable M12x140 PA/SST cpl.
19	2	99-20-1609	washer A 13.0x37x3.0 DIN 9021 SST
20	1	99-10-4052	spacer M 5x60 (118x60)
21	1	83-03-9695	bearing for bottom of nest NAT-60 BD-C2+
22	2	83-03-9718	supporting elbow galv. for cover SST NAT-60

6.5.2 Screwing of cage stand 1206 (centre of section)

Screwing of the basic frame is carried out as shown for cage stand 2412 in chapter6.4.2 . In addition, "supports for approach grates" and "supporting elbows galv. for cover SST NAT-60" have to be installed.



details A and B: see the following page



Pos.	Qty.	Code no.	Description
1	1	83-03-9720	support approach grating / level in front of nest NAT-60-1800
2	1	83-04-3265	support for bottom wire grille MB-level 1200 NAT-60-1800
3	1	83-04-3264	support for bottom wire grille MB-level 1540 NAT-60-1800
4	2	83-03-9718	supporting elbow galv. for cover SST NAT-60
5	6	99-10-1067	hexagon head screw M 6x16 galv. DIN 933 8.8
6	4	99-10-1100	hexagon head screw M 6x12 galv. DIN 933 8.8
7	10	99-10-1045	hexagon nut M 6 galv. DIN 934-8

7 Setting up the carcass

7.1 Installation of the side rails

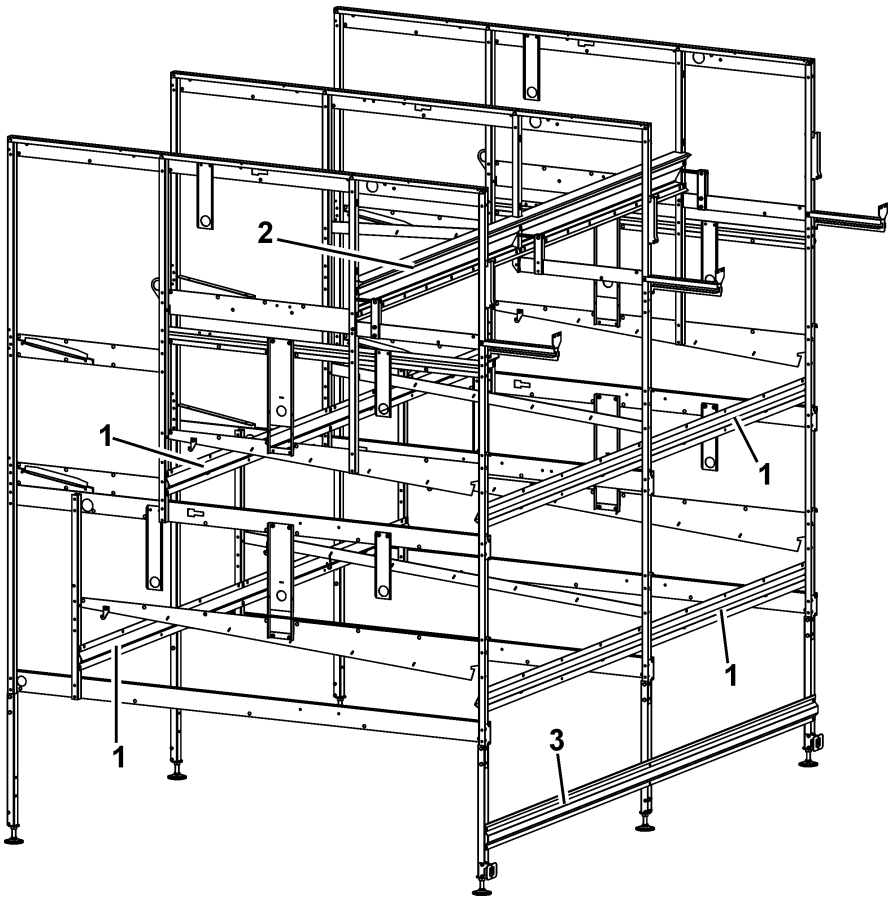
Important:

Pay attention to correct overlapping of the side rails!

Begin on the manure belt drive side and mount the side rails of the sections that are subsequently erected always **on top** of the previously erected section:

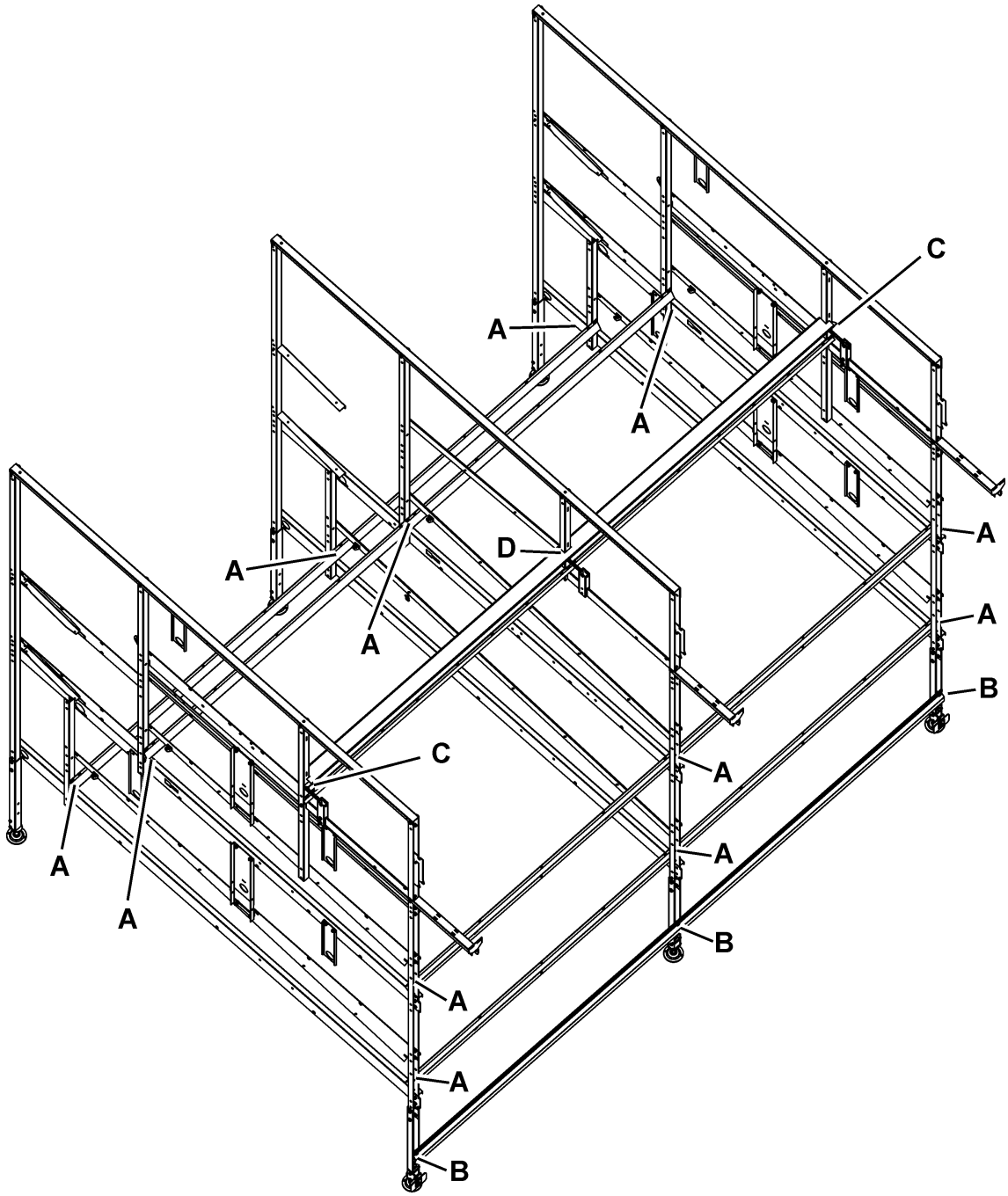
--> Do not place any sharp edges in the running direction of the manure belt towards the drive.

To avoid any tolerance in length during further assembly works, tighten the screw unions as much as possible, by hand!



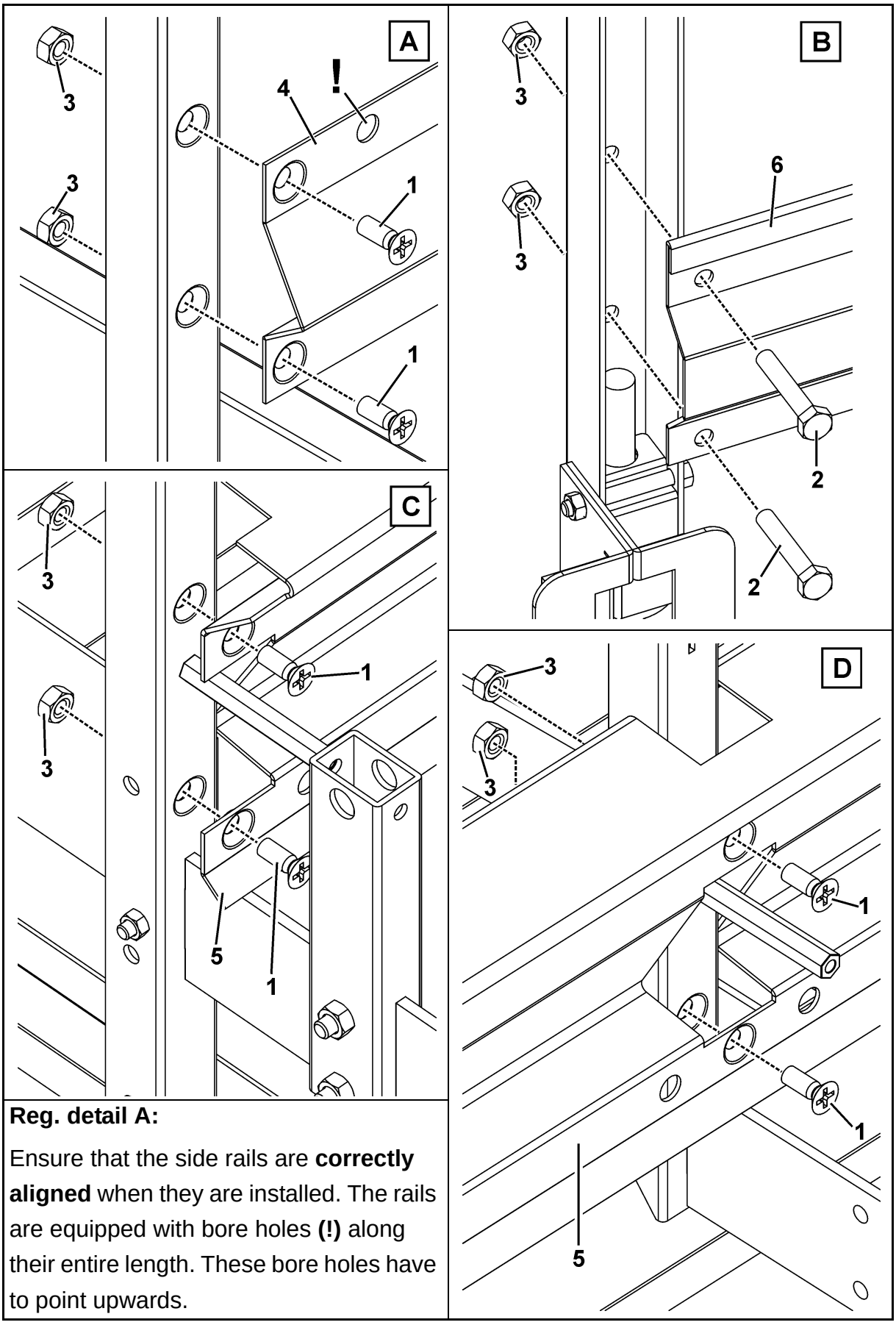
Pos.	Qty.	Code no.	Description
1	4	83-03-9725	side rail 2412 MB NAT-60
2	1	83-02-3865	side rail 2412 BD-C2+
3	1	83-04-1191	side rail 2412 scratching area NAT-60

Screwing positions



Detail A-D: see the following page

Pos.	Qty.	Code no.	Description
1	30	99-10-1368	countersunk screw/cross recess M 6x16DIN 965-5.8 galv
2	6	99-10-1232	hexagon head screw M 6x35 galv. DIN 931-8.8
3	36	99-10-1045	hexagon nut M 6 galv. DIN 934-8
4	4	83-03-9725	side rail 2412 MB NAT-60
5	1	83-02-3865	side rail 2412 BD-C2+
6	1	83-04-1191	side rail 2412 scratching area NAT-60



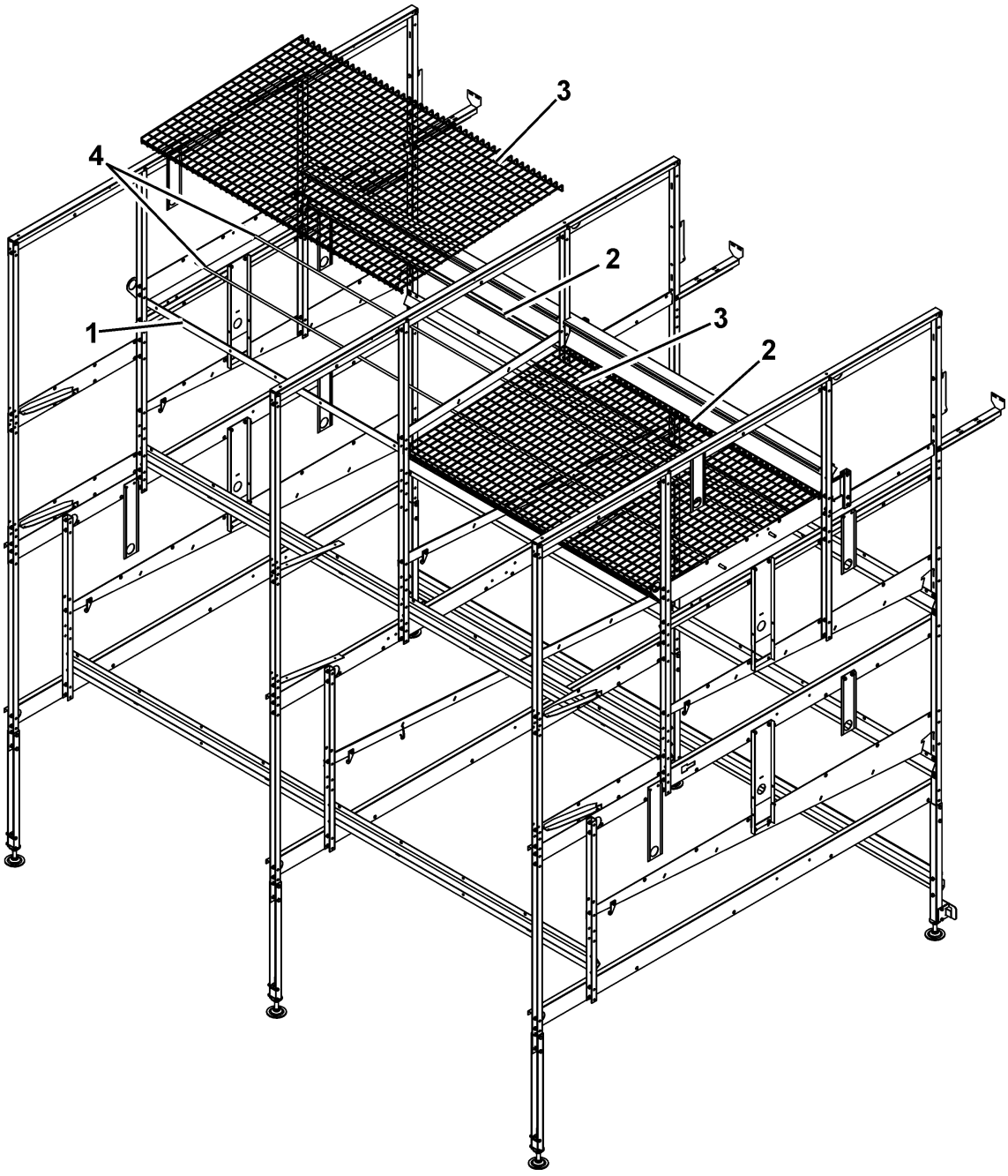
Reg. detail A:

Ensure that the side rails are **correctly aligned** when they are installed. The rails are equipped with bore holes **(!)** along their entire length. These bore holes have to point upwards.

position numbers: see previous page

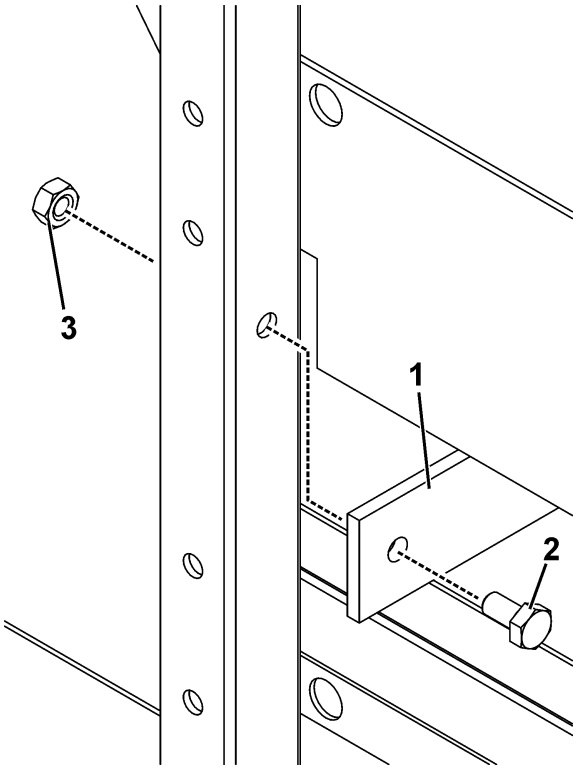
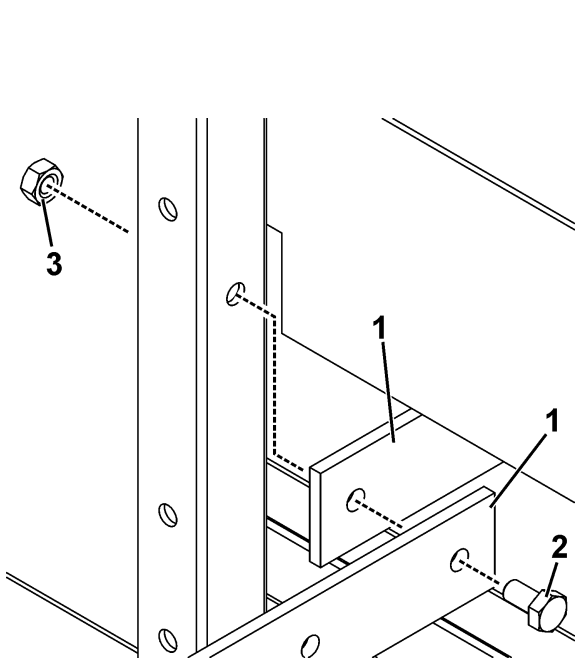
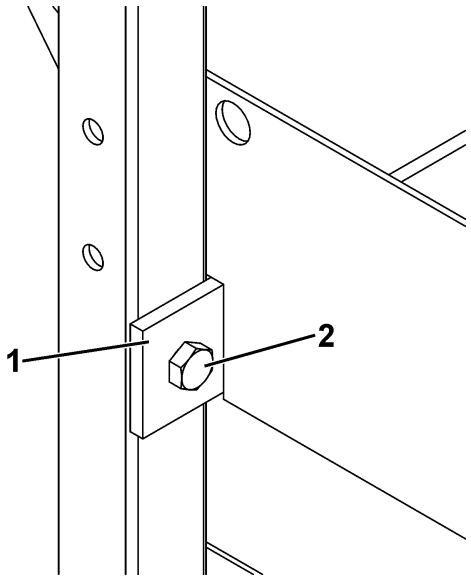
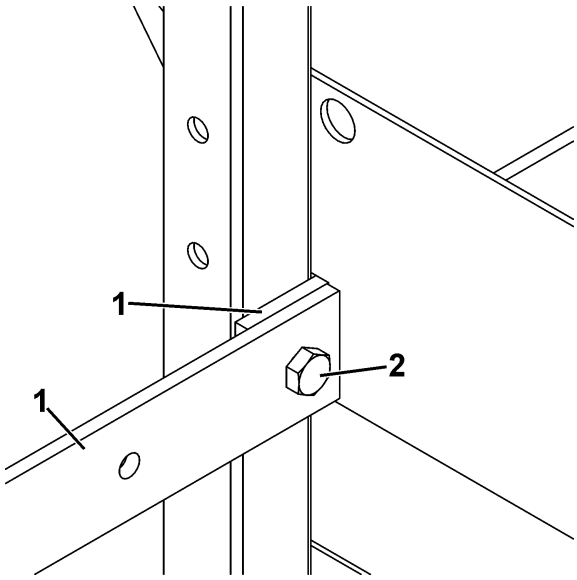
8 Assembly of the approach grates at the top in front of the nest

8.1 General view



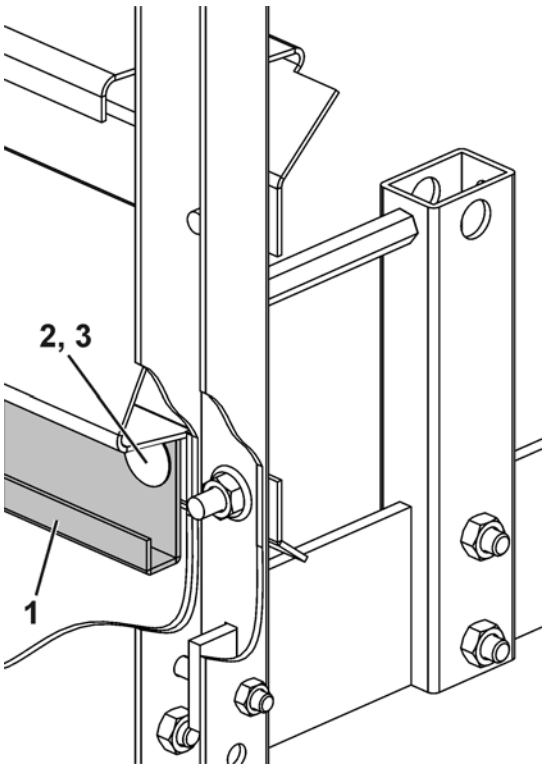
Pos.	Qty.	Code no.	Description
1	1	83-03-9729	support 2412 for approach grating in front of nest NAT-60
2	2	83-03-9731	acceptance approach grating in front of nest NAT-60
3	2	83-03-9524	approach grating 1206 level in front of nest NAT-60-1800 BD-C2+ (ZnAl)
4		37-46-3708	rod 8x5000

8.2 Assembly of the support for approach grating

Screwing of the support for the approach grating at the beginning / end of a row	Screwing of consecutive supports for approach gratings
	
	

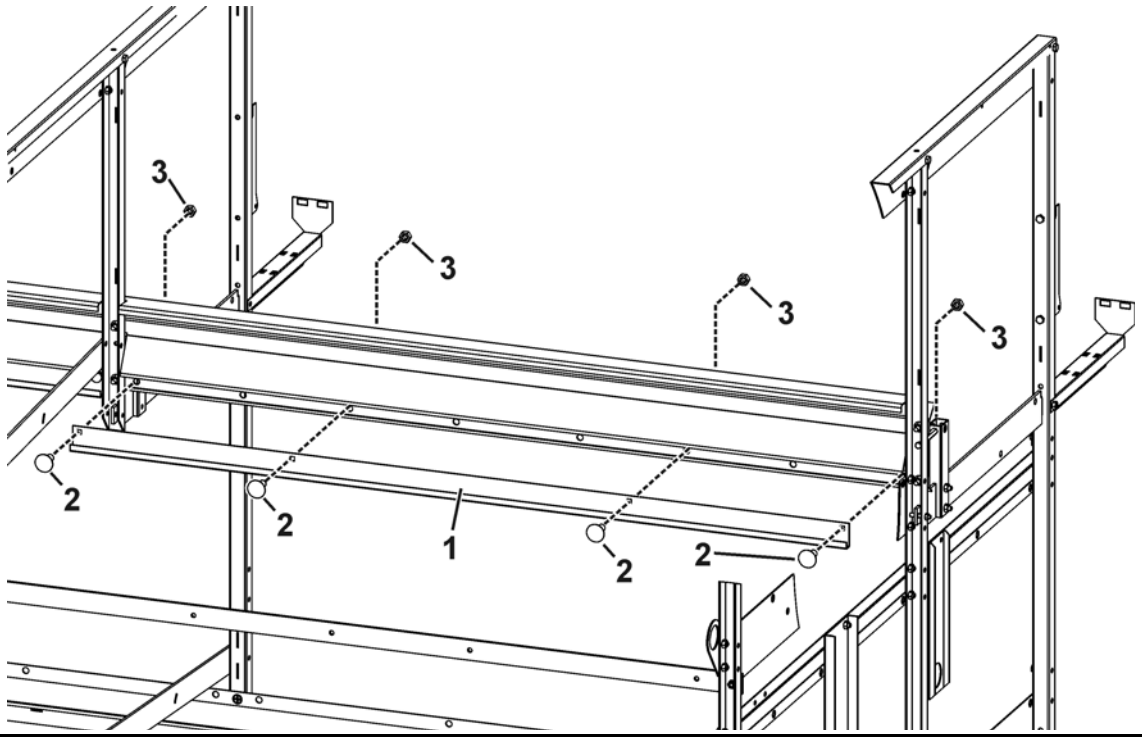
Pos.	Qty.	Code no.	Description
1	1	83-03-9729	support 2412 for approach grating in front of nest NAT-60
2	1	99-10-1100	hexagon head screw M 6x12 galv.
3	1	99-10-1045	hexagon nut M 6 galv. DIN 934-8

8.3 Installation of the retainer f/ the approach grating in front of nest



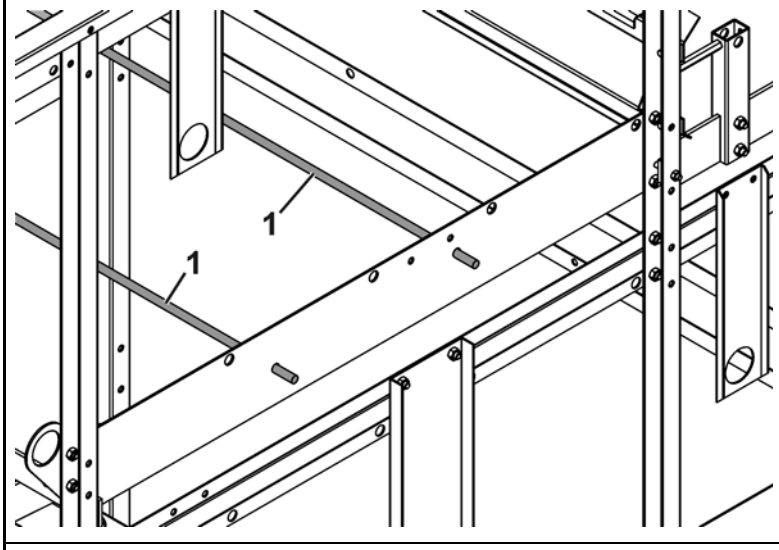
For each section 2412 two "retainers for approach grating in front of nest" are needed. Every retainer is screwed to the "side rail 2412 BD-C2+" by means of 4 saucer-head screws.

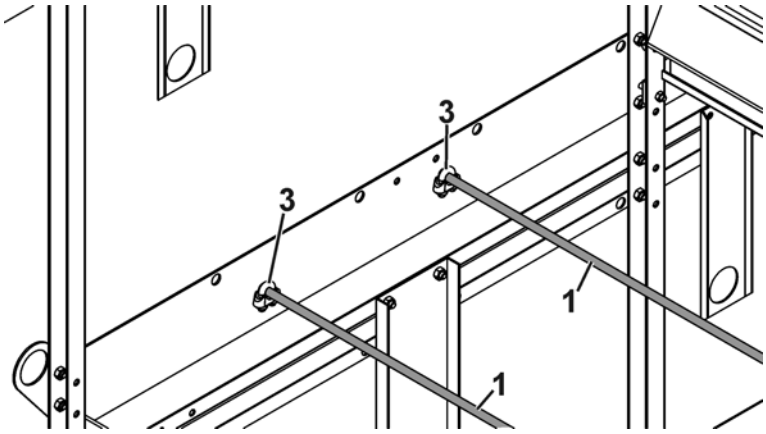
For the correct alignment: see illustration



Pos.	Qty.	Code no.	Description
1	2	83-03-9731	retainer approach grating in front of nest NAT-60
2	8	99-10-1602	mushroom head square neck bolt M6x16 DIN 603 galv.
3	8	99-10-1045	hexagon nut M 6 galv. DIN 934-8

8.4 Installation of the rods for the approach grating in front of the nest



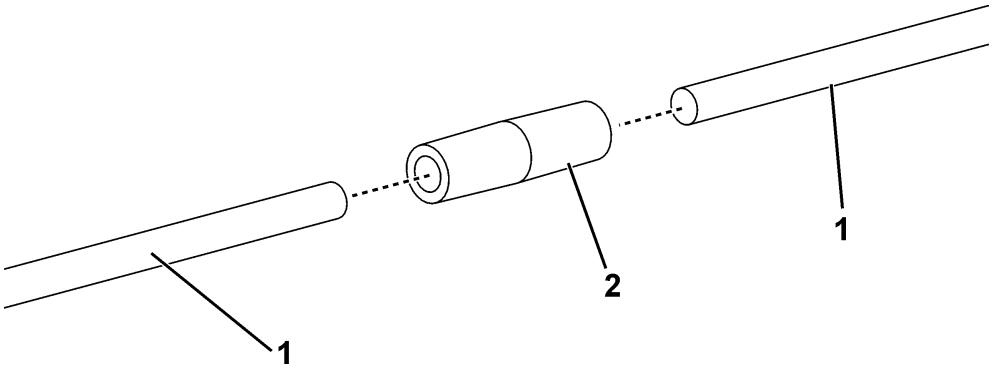


To stabilize the upper approach gratings, 2 rows of rods have to be inserted.

Two consecutive rods are connected by means of connection tubes Ø8mm.

The rods are fastened to the first and last cage stand of a row by means of cable clamps **from the inside of the section**.

The wire must protrude at least 3-4 cm.



Pos.	Qty.	Code no.	Description
1		37-46-3708	rod 8x5000
2		37-46-3709	connection tube dia 8mm PA6.6
3	4	99-50-0090	cable clamp 8mm 5/16" galv. DIN 741

8.5 Laying out the approach gratings in front of the nest

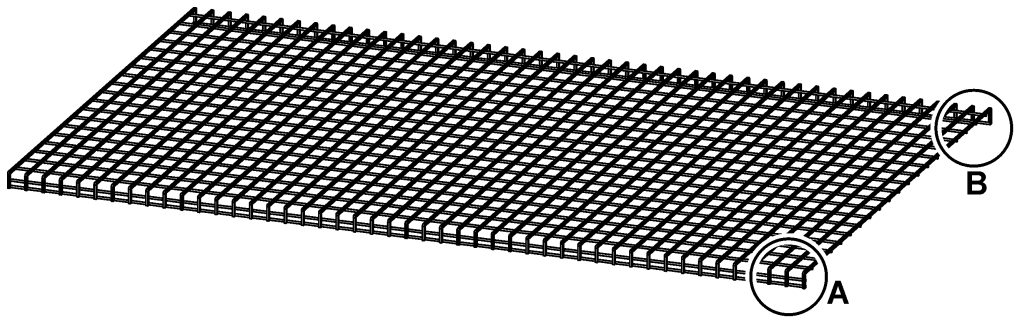
Important:

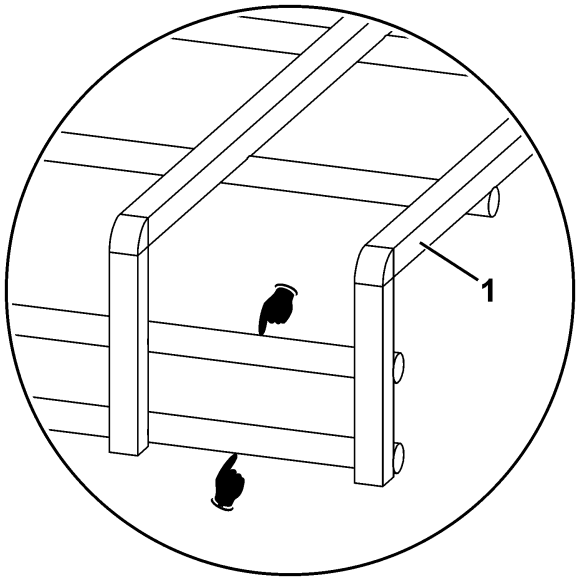
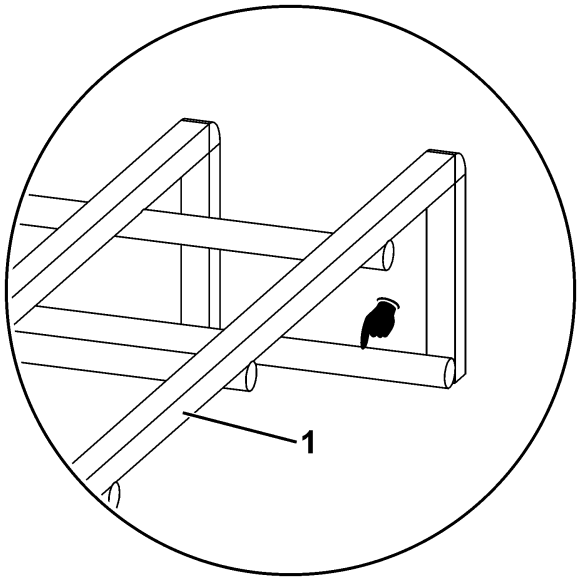
The approach gratings are folded at the sides. One fold has 2 longitudinal wires (A) and the other fold has only 1 longitudinal wire (B).

2 longitudinal wires = rest for the supports of the approach grating

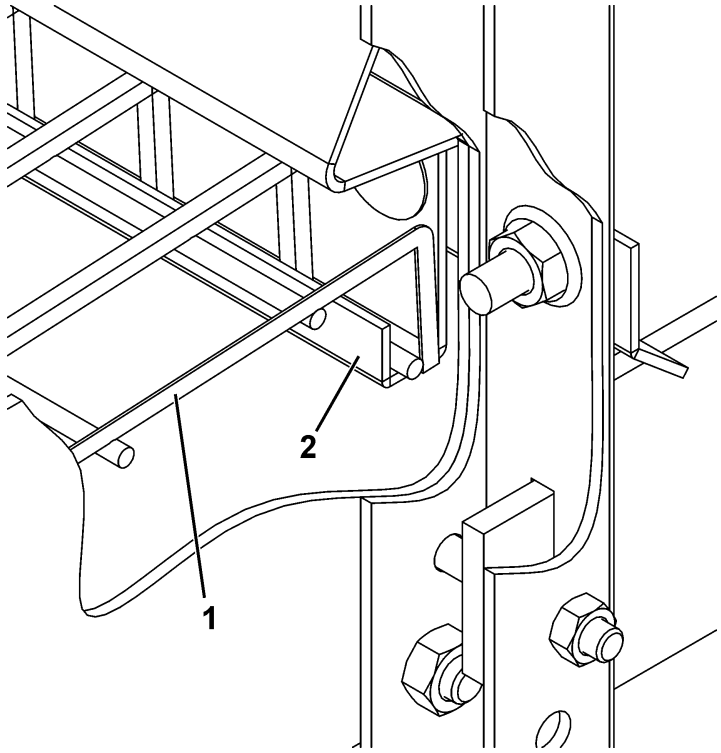
1 longitudinal wire = insertion into the retainers for the approach grating.

In addition, the gratings must be partly **released** at the corners in order to lay them out without strain.



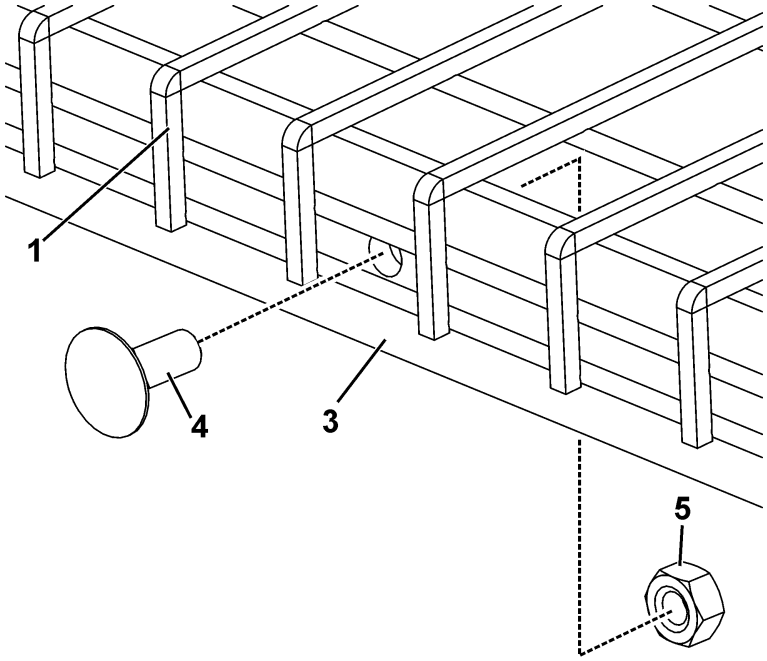
detail A: fold for "support approach grating"	detail B: fold for "retainer approach grating"
	

Pos.	Qty.	Code no.	Description
1	2	83-03-9524	approach grating 1206 level in front of nest NAT-60-1800 BD-C2+ (ZnAl)



Every approach grating has to be inserted in the retainers with the respective side.

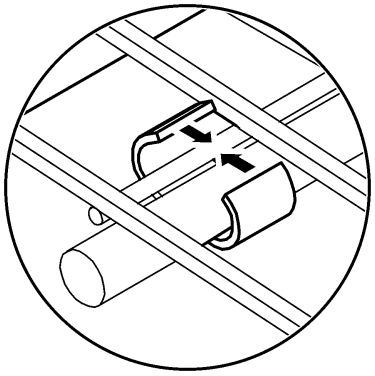
Screwing is not necessary.



Every approach grating is screwed to the "support for approach grating" by means of **5 mushroom head square neck bolts and nuts.**

Pos.	Qty.	Code no.	Description
1	2	83-03-9524	approach grating 1206 level in front of nest NAT-60-1800 BD-C2+ (ZnAl)
2	2	83-03-9731	retainer approach grating in front of nest NAT-60
3	1	83-03-9729	support 2412 for approach grating in front of nest NAT-60
4	10	99-10-1602	mushroom head square neck bolt M6x16 DIN 603 galv.
5	10	99-10-1045	hexagon nut M 6 galv. DIN 934-8

8.5.1 Fixation of the approach gratings by means of clips

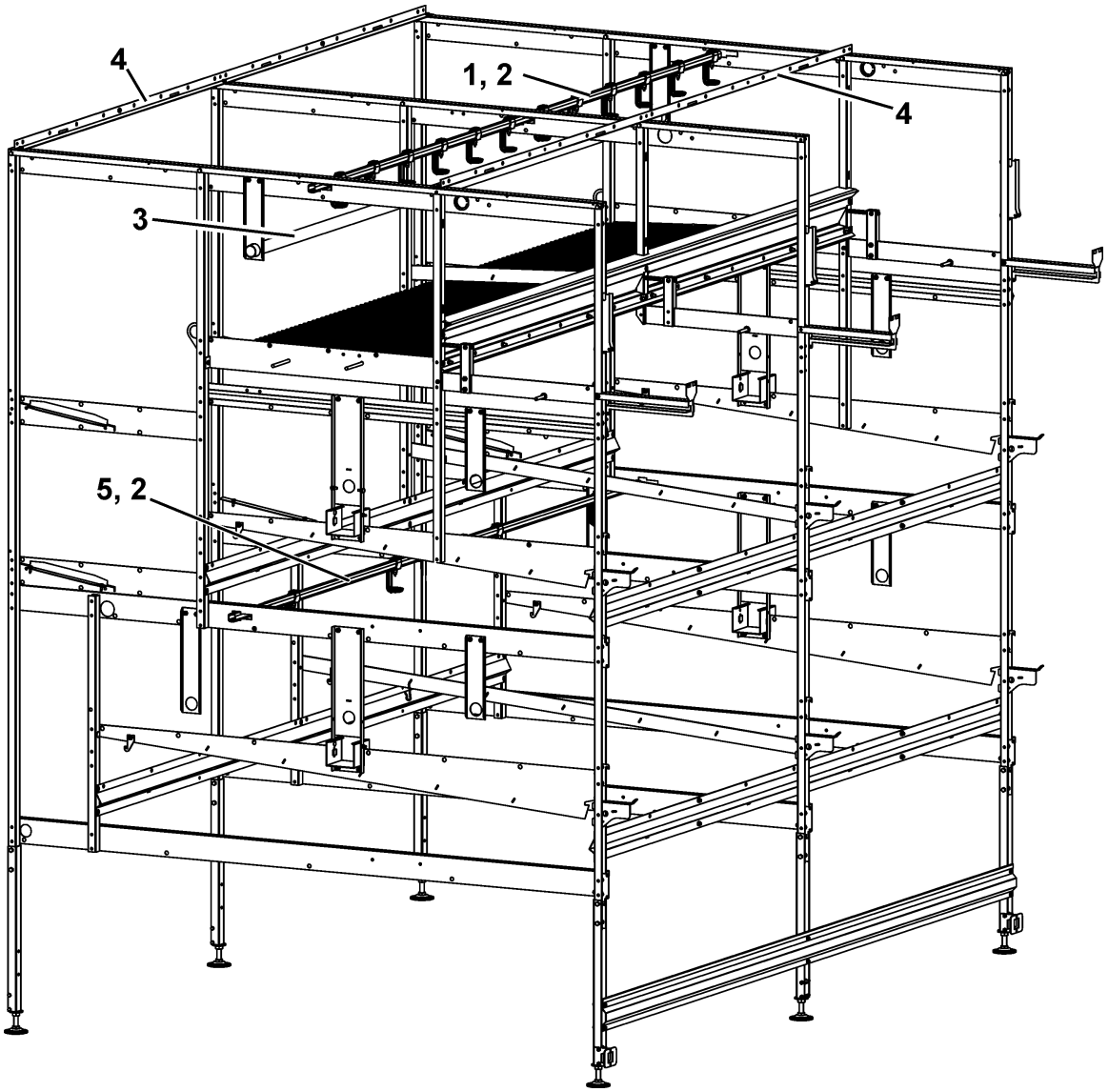


Every rod of every grating has to be fastened with 3 clips.

Pos.	Qty.	Code no.	Description
		38-90-3714	clip 10x1.2 SST

9 Assembly of the upper perch in front of the nest, drinkers and roof wire rails

9.1 General view



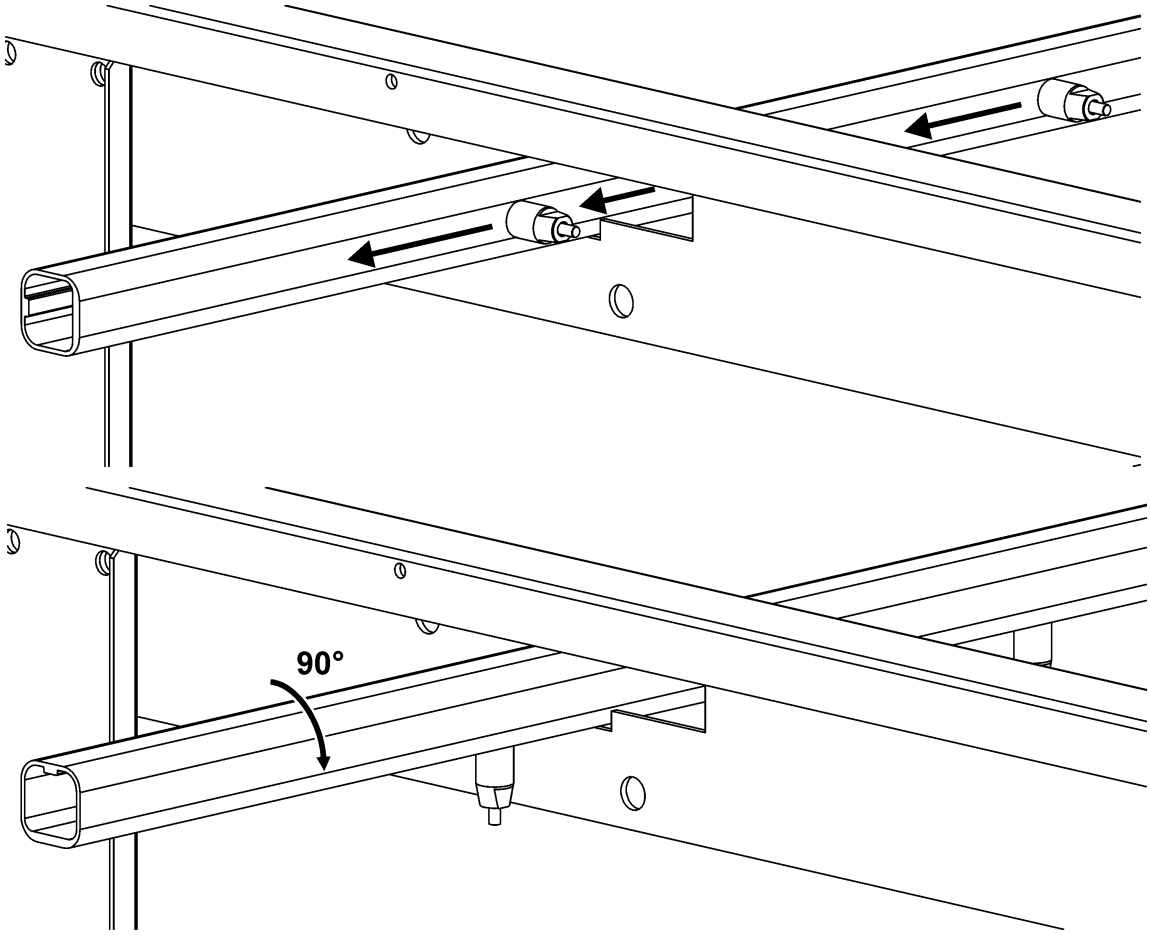
Pos.	Qty.	Code no.	Description
1		30-00-3211	nipple pipe 4796-24-top-SST-red. NATURA-Nova
2	16	83-01-4052	drip cup round 1-arm NAT with bracket L
3		83-02-2549	tube 33.5x1.50-5800 reduced (coupled 5750)
4	2	83-03-9740	angle 2412 for top wire mesh NAT-60
5		83-02-3775	nipple pipe 4796-8-top-SST red. NAT-Nova

9.2 Assembly of the drinkers

	The drip water cups can be mounted only after the nipple tube was inserted through the cross member.

9.2.1 Insertion of the nipple tubes in the cross supports

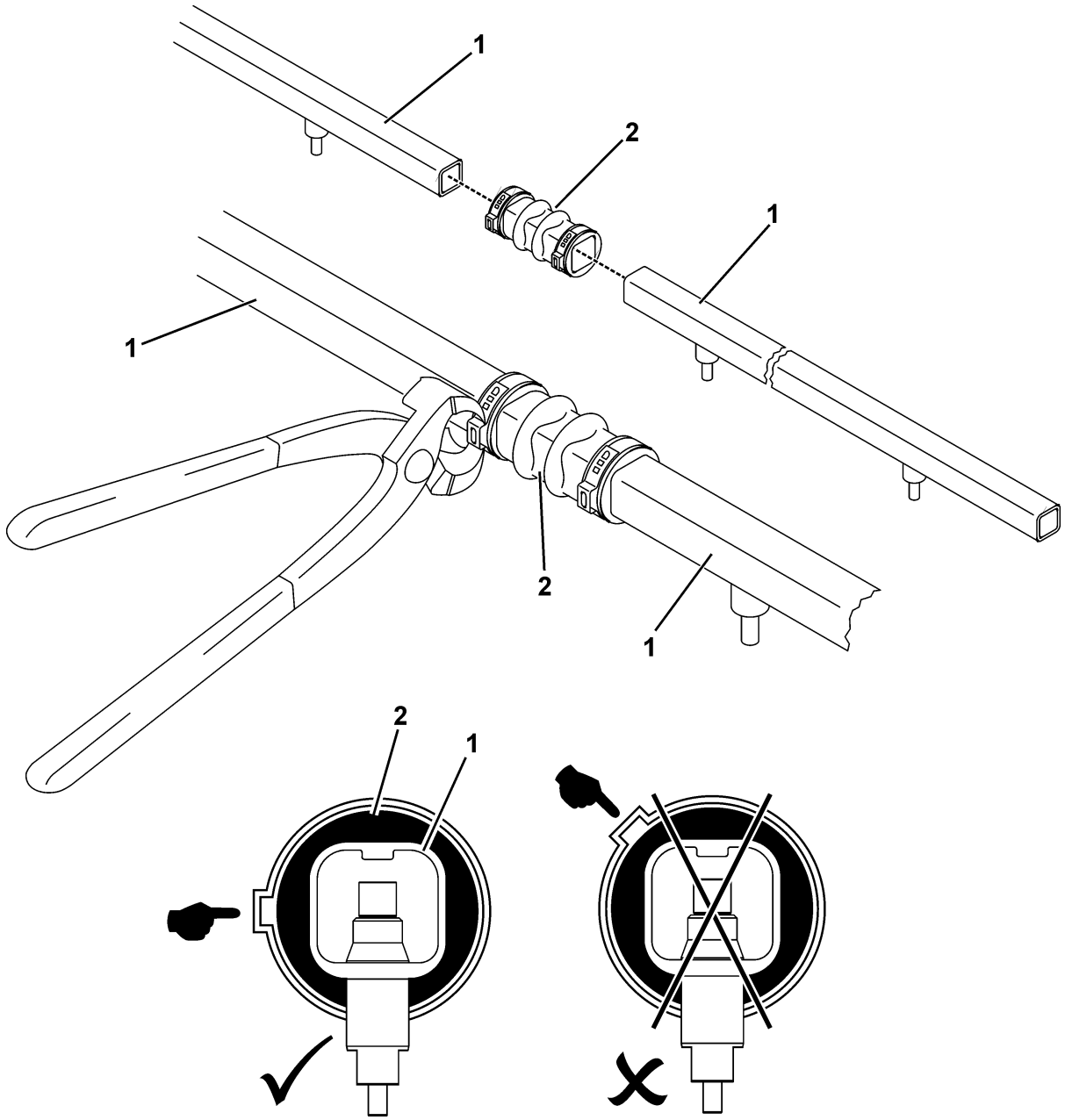
Shown on the example of the upper drinker



Pos.	Qty.	Code no.	Description
1		30-00-3211	nipple pipe 4796-24-top-SST-red. NATURA-Nova

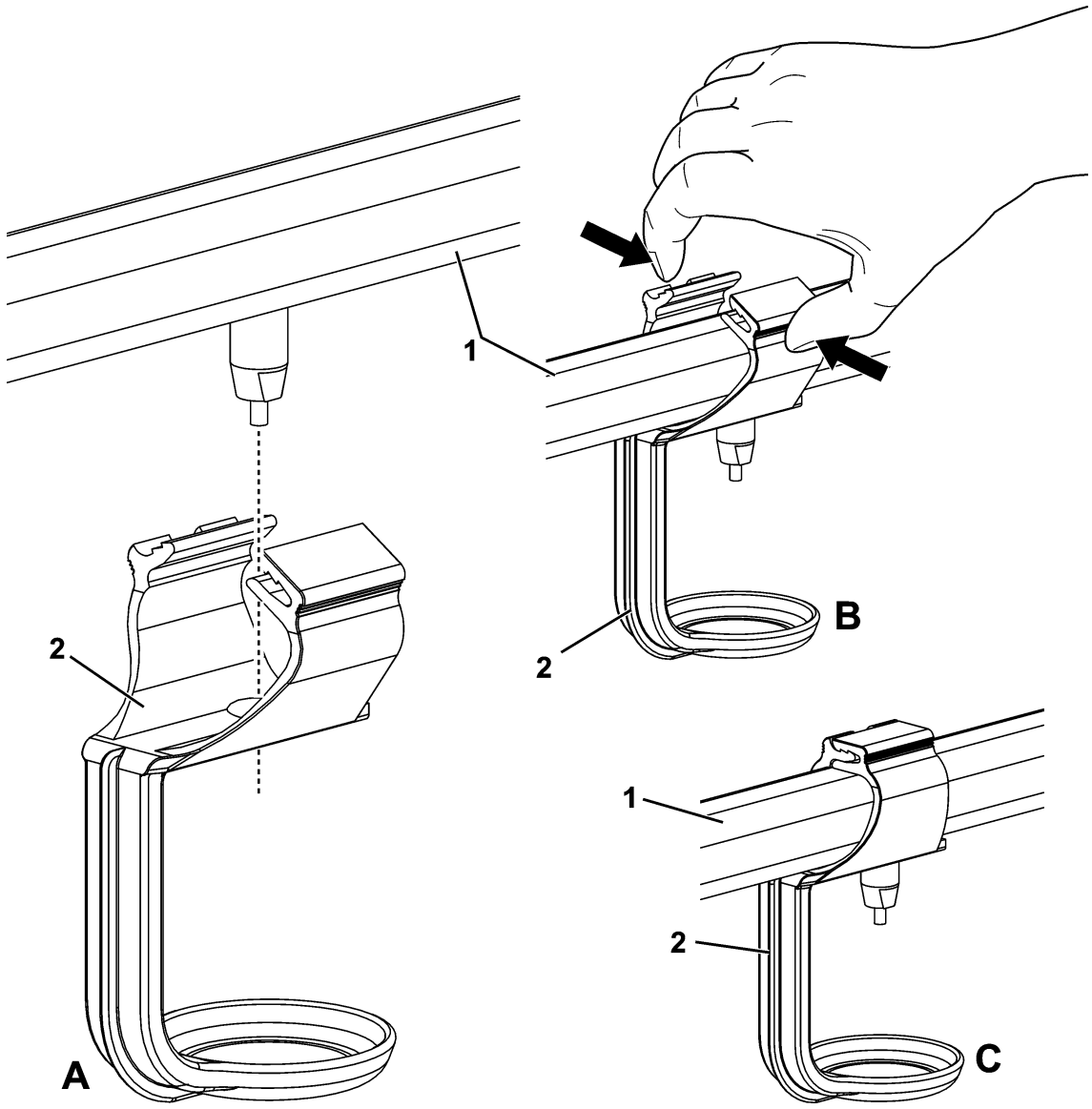
9.2.2 Connecting the nipple pipes

☝	Pinch the clamping pieces of the couplings together but only on the straight sides of the nipple pipe as shown below. **Never at the edge of the nipple pipe!**



Pos.	Qty.	Code no.	Description
1		30-00-3211	nipple pipe 4796-24-top-SST-red. NATURA-Nova
2		30-00-3025	coupler cplt W-PVC/galv for nipple tube-22 laying/floor management

9.2.3 Installation of the drip water cups at the nipple tube



Pos.	Qty.	Code no.	Description
1		30-00-3211	n pipe 4796-24-top-SST-red. NATURA-Nova
2	12	83-01-4052	drip cup round 1-arm NAT with bracket L

9.3 Installation of the upper perches

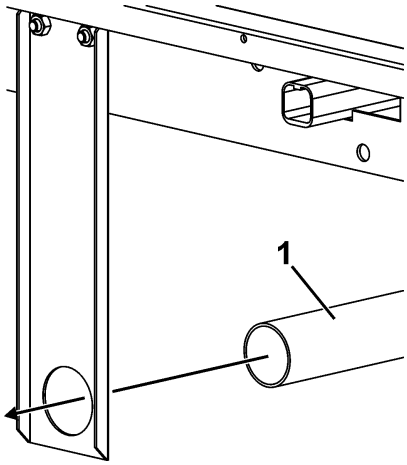
9.3.1 Insertion of the tubes

Important:

Start the assembly of the tubes at the manure belt drive side.

The **tapered ends of the tubes** must point towards the manure belt drive!

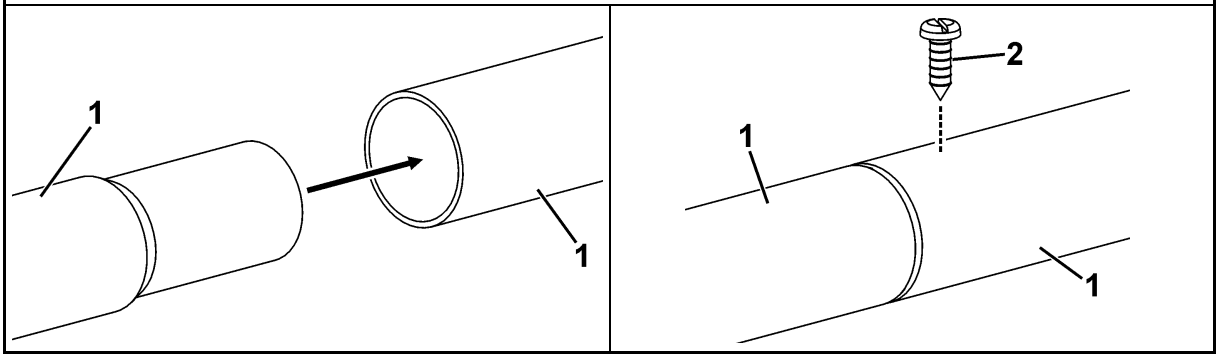
Insertion of the top tubes



Pos.	Qty.	Code no.	Description
1		83-02-2549	tube 33.5x1.50-5800 reduced (coupled 5750)
2	2	99-10-3882	drilling screw 4,8x16 DIN 7504-L

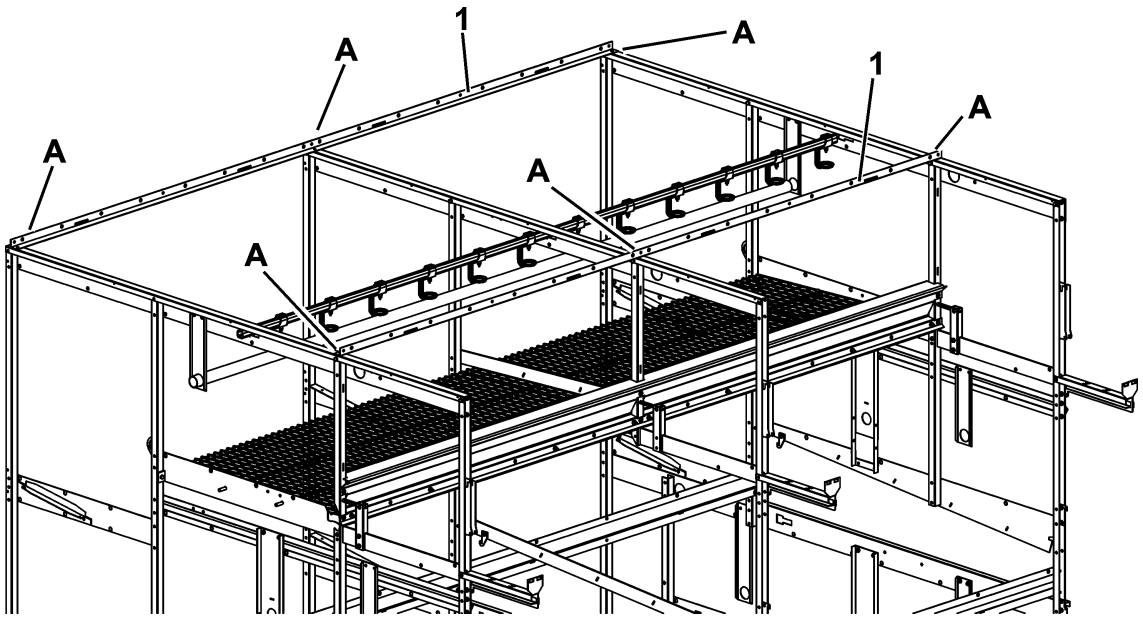
9.3.2 Coupling and screwing of the tubes

Plug the tubes together and secure every coupling link with a drilling screw.

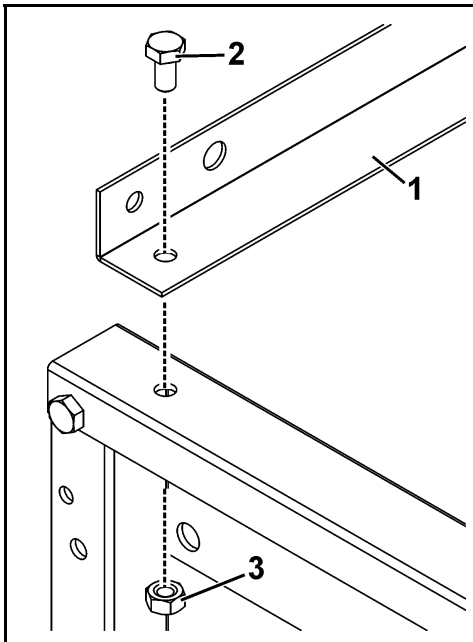


9.4 Assembly of the roof wire rails

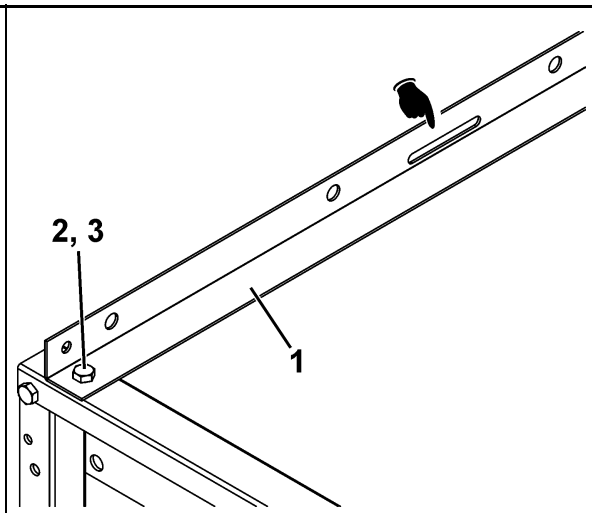
A= screw positions of the roof wire rails



Pos.	Qty.	Code no.	Description
1	2	83-03-9740	angle 2412 for top wire mesh NAT-60
2	6	99-10-1100	hexagon head screw M 6x12 galv.
3	6	99-10-1045	hexagon nut M 6 galv. DIN 934-8



The roof wire rails are screwed to the cross members by means of hexagon head screws M6x12 and nuts.



Alignment: The longish openings for the clips for the top wire mesh have to point towards the side.

10 Assembly of the nests

	For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

10.1 Assembly of the nest floor with tubular transmission for the nest floor

There are different drives for the expel system available:

Drives per row:

Pos	**Code No.**	**Description**
1	36-00-6200	drive RW f 45 cpl. for eject. mech. row end
Calculation: 1x up to 41m per single row / 2x up to 41m per double row		

Pos	**Code No.**	Description
2	36-00-6210	drive RW245 cpl f/eject.mechan. row end
Calculation: 1x up to 60m per single row / 2x up to 60m per double row		

Pos	**Code No.**	**Description**
3	37-97-5901	drive EWA12 cpl f/eject.mechan NAT-60 BD-C2+ single row NAT-60/BD-C2+
Calculation: 1x up to 97m per single row / 2x up to 97m per double row		

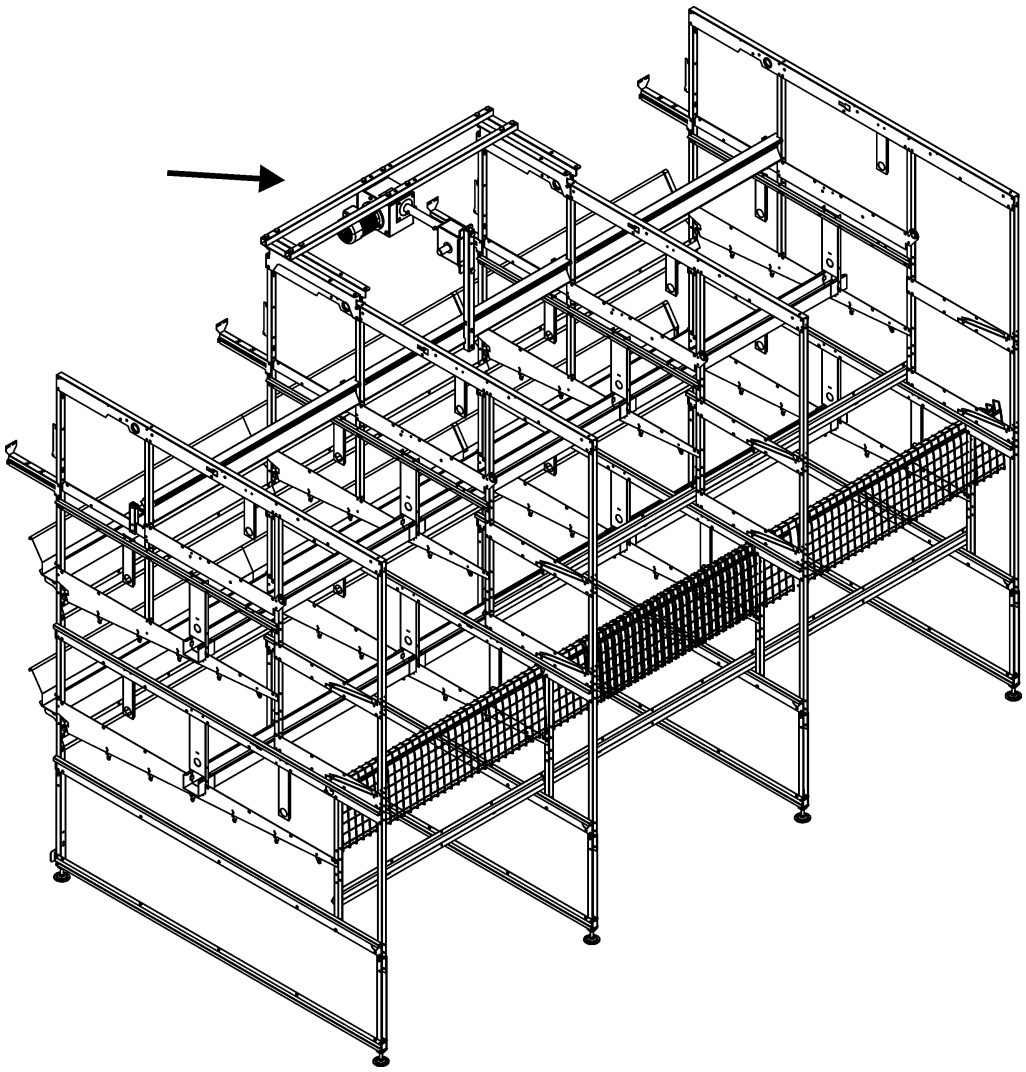
Drive only for double row (with a central observation walkway per 2 rows):

Pos	**Code No.**	**Description**
4	37-97-5900	drive EWA12 cpl f/eject.mechan EWA 12 double row NAT-60/BD-C2+, distance between rows 1022mm
Calculation: 1x up to 97m per double row		

	Important: When choosing the drives for the ejection mechanism it has to be observed that drives of the **same type** are used in all rows of **one** house.

10.1.1 Assembling the drive in the middle of a row (single row)

Described below: 37-97-5901 Drive EWA12 cpl f/eject.mechan. single row NAT-60/ BD-C2+

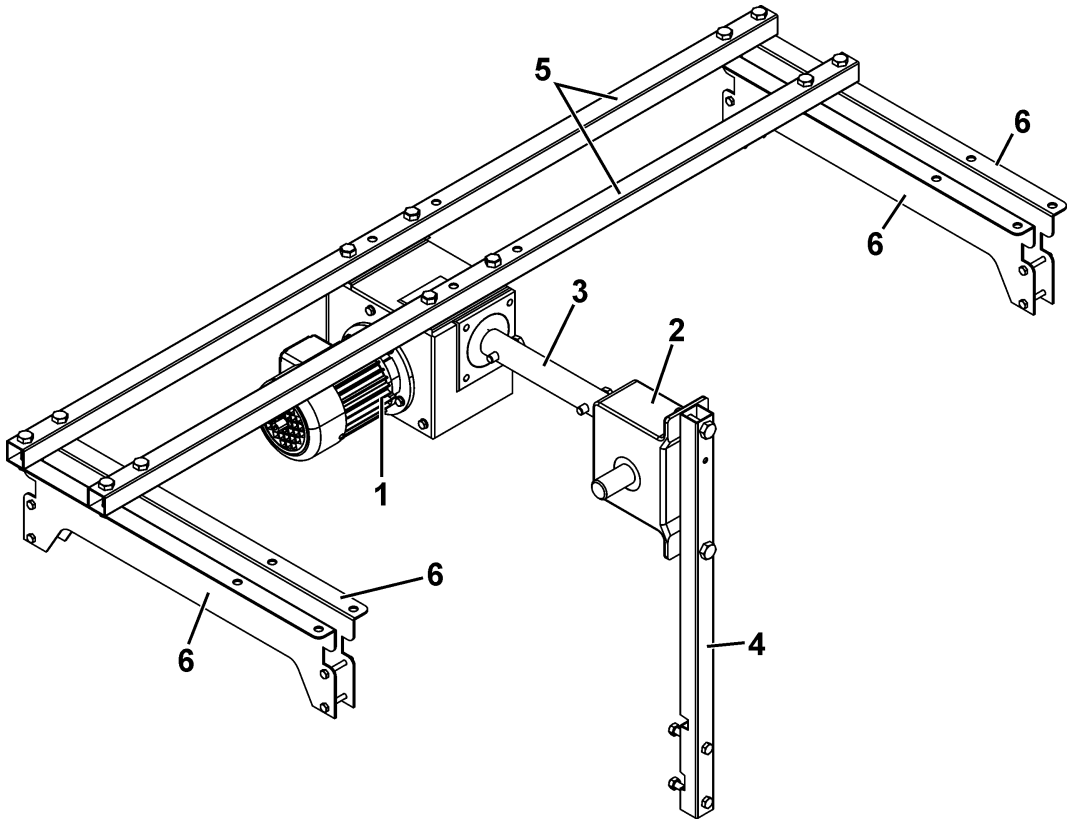


Pos.	Qty.	Code no.	Description
		37-97-5901	drive EWA12 cpl f/eject.mechan. single row NAT-60/BD-C2+
consisting of:			
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	1	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
3	1	83-04-2627	tube 1"x 207 f/connect. drive/ gearbox f/eject. mechan. NAT60
4	1	83-04-2478	brace at side member BD-C2+ for worm gear pair

Pos.	Qty.	Code no.	Description
5	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
6	4	83-04-2626	cross connector single for eject. mechanism NAT-60/BD-C2+

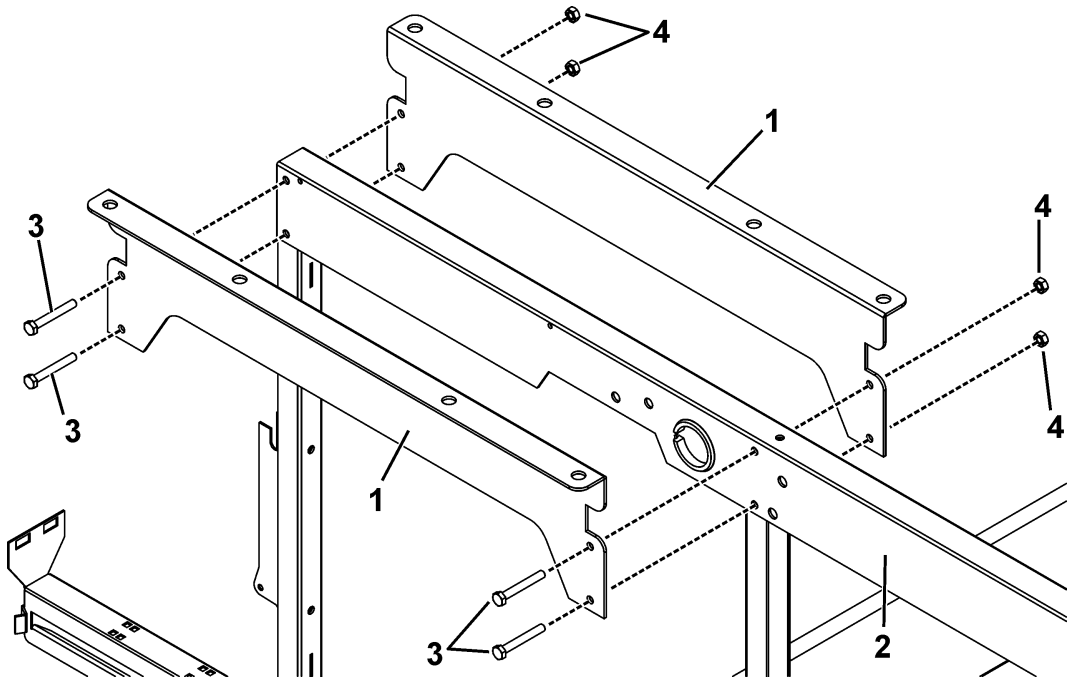
+ screws, nuts and spring washers

10.1.1.1 Component parts of drive for ejection mechanism (EWA12 single row)



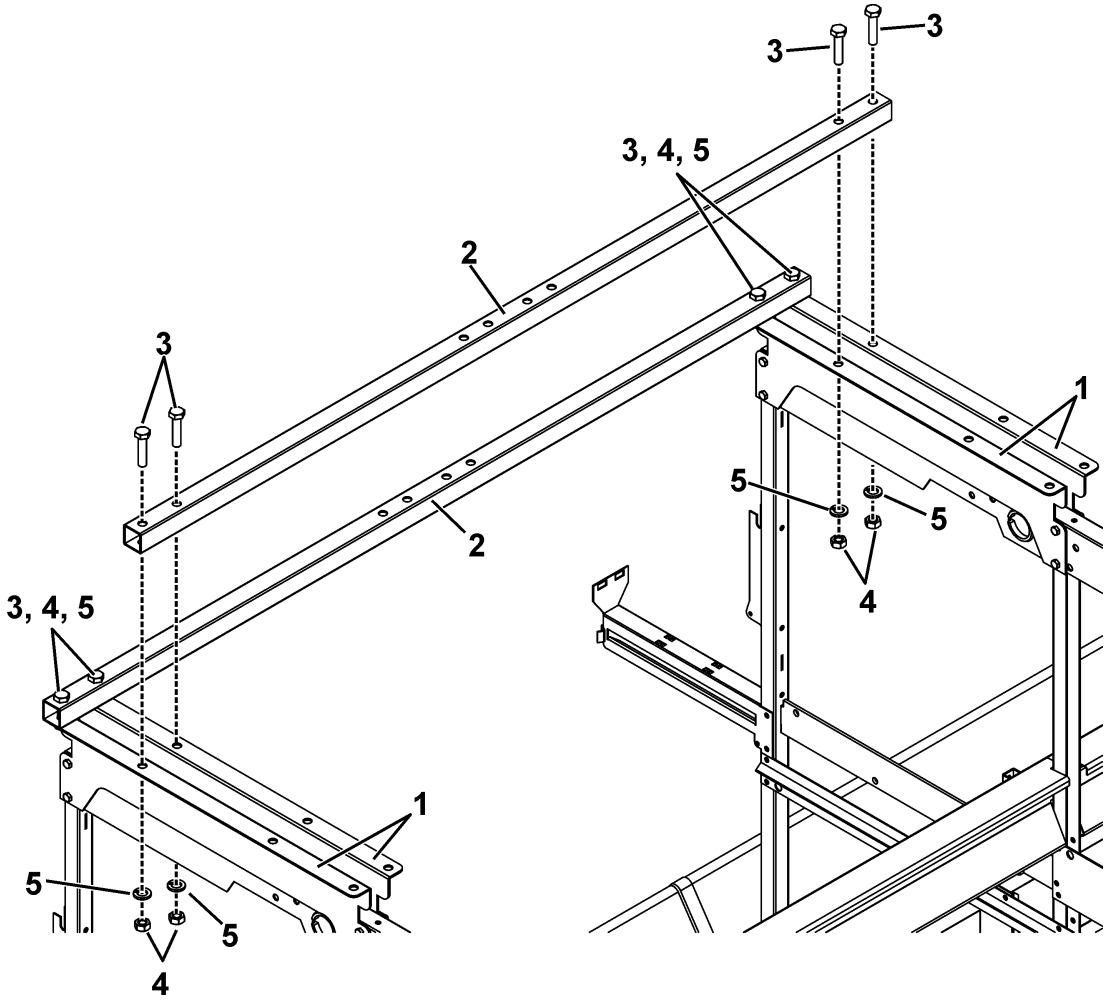
Pos.	Qty.	Code no.	Description
		37-97-5901	drive EWA12 cpl f/eject.mechan. single row NAT-60/BD-C2+
consisting of:			
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	1	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
3	1	83-04-2627	tube 1"x 207 f/connect. drive/ gearbox f/eject. mechan. NAT60
4	1	83-04-2478	brace at side member BD-C2+ for worm gear pair
5	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
6	4	83-04-2626	cross connector single for eject. mechanism NAT-60/BD-C2+

10.1.1.2 Screwing - cross connector single



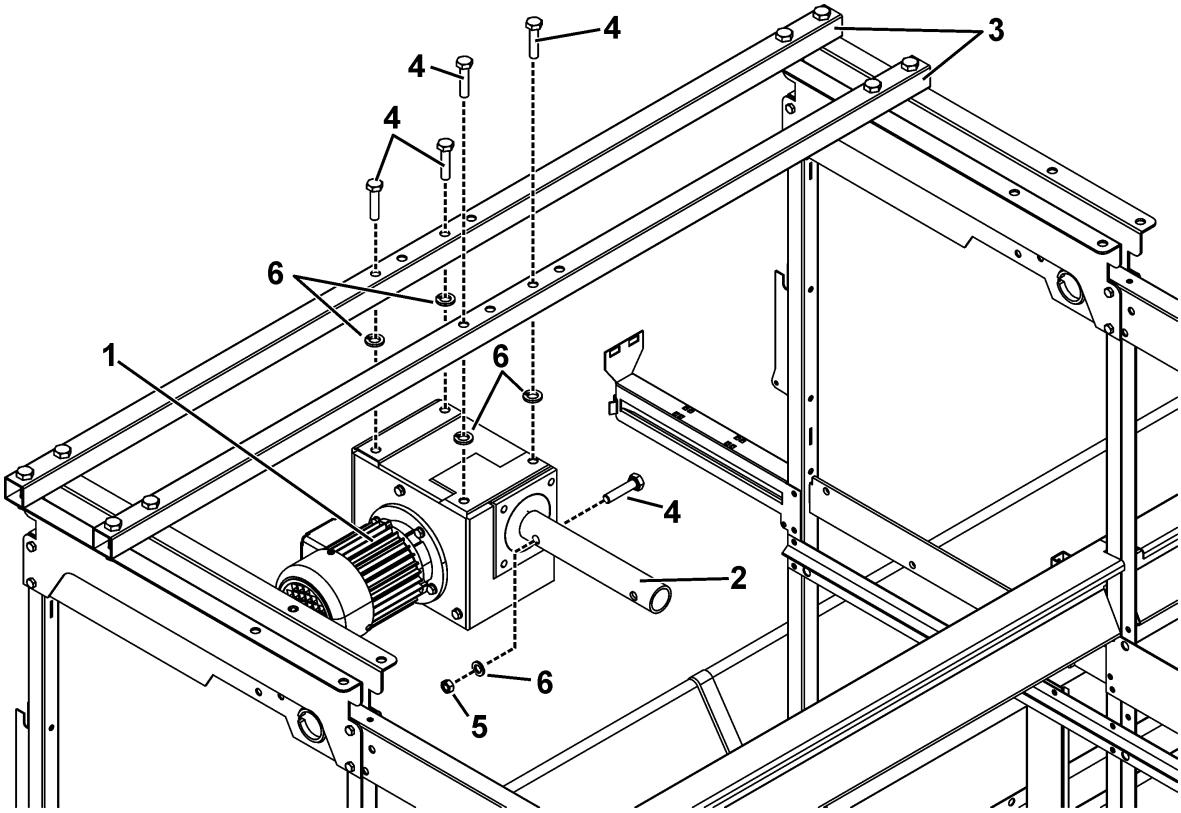
Pos.	Qty.	Code no.	Description
1	2	83-04-2626	cross connector single for eject. mechanism NAT-60/BD-C2+
2	1	83-03-9705	cross member upper NAT-60-1800
3	4	99-10-1260	hexagon head screw M 6x 45 galv. DIN 933-8.8
4	4	99-10-1045	hexagon nut M 6 galv. DIN 934-8

10.1.1.3 Screwing - cross bars for motor suspension



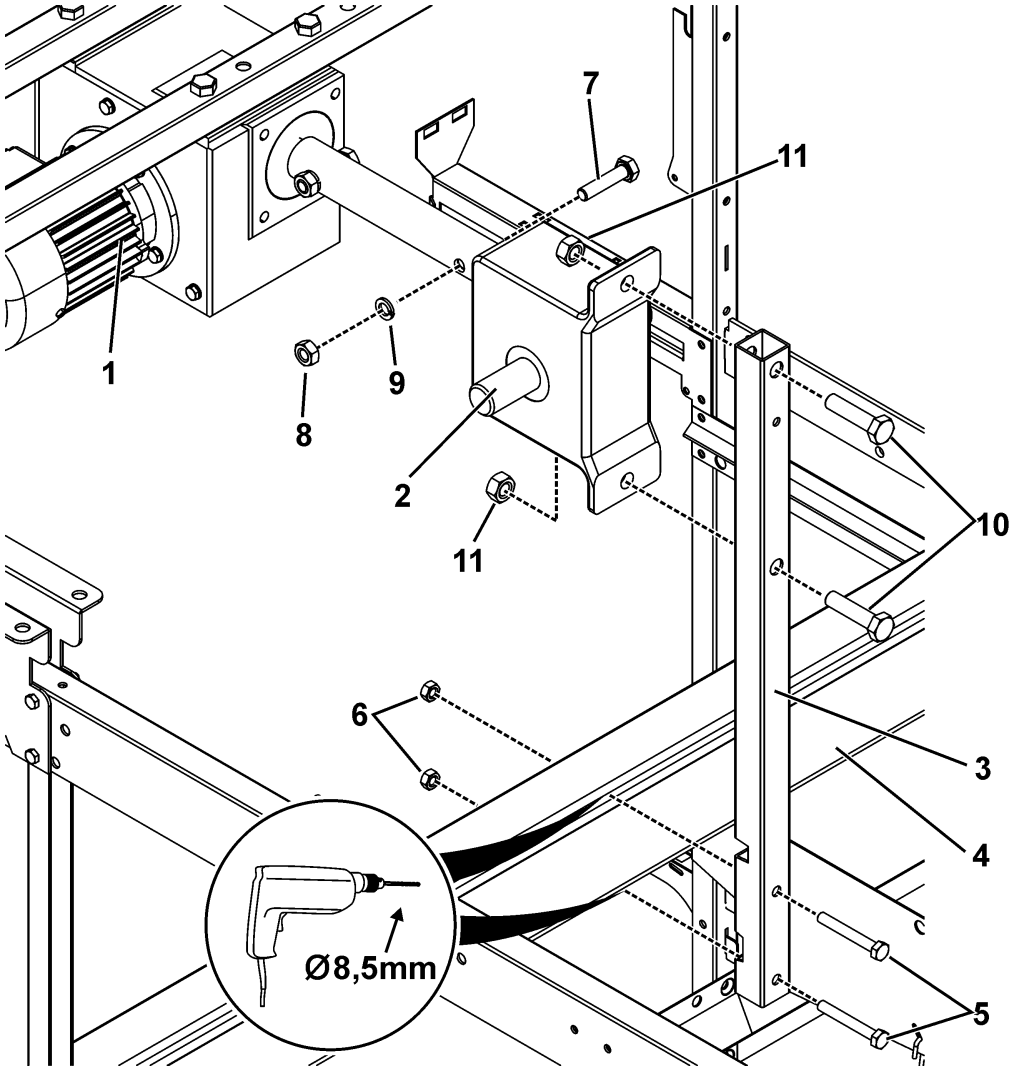
Pos.	Qty.	Code no.	Description
1	4	83-04-2626	cross connector single for eject. mechanism NAT-60/BD-C2+
2	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
3	8	99-10-1250	hexagon head screw M 10x 45 DIN 558 galv.
4	8	99-20-1029	hexagon nut M 10 galv DIN 555
5	8	99-20-1055	spring washer A 10 DIN 127-galv.

10.1.1.4 Screwing - drive at cross bars for motor suspension



Pos.	Qty.	Code no.	Description
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	1	83-04-2627	tube 1"x 207 f/connect. drive/ gearbox f/eject. mechan.
3	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
4	5	99-10-1250	hexagon head screw M 10x 45 DIN 558 galv.
5	5	99-20-1029	hexagon nut M 10 galv DIN 555
6	5	99-20-1055	spring washer A 10 DIN 127-galv.

10.1.1.5 Screwing - worm gear pair



Pos.	Qty.	Code no.	Description
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	1	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
3	1	83-04-2478	brace at side member BD-C2+ for worm gear pair
4	1	83-02-3865	side rail 2412 BD-C2+
5	8	99-10-1278	hexagon head screw M 8x 60 galv. DIN 558
6	8	99-10-1040	hexagon nut M 8 galv. DIN 934-8
7	8	99-10-1250	hexagon head screw M 10x 45 DIN 558 galv.
8	8	99-20-1029	hexagon nut M 10 galv. DIN 555
9	8	99-20-1055	spring washer A 10 DIN 127-galv.
10	8	99-10-1103	hexagon head screw M 12x 50 galv. DIN 558
11	8	99-20-1032	hexagon nut M 12 galv. DIN 555

Regarding the fastening of the nest floor drive tubes to the worm gear pair see chapter: 10.1.3.2 .

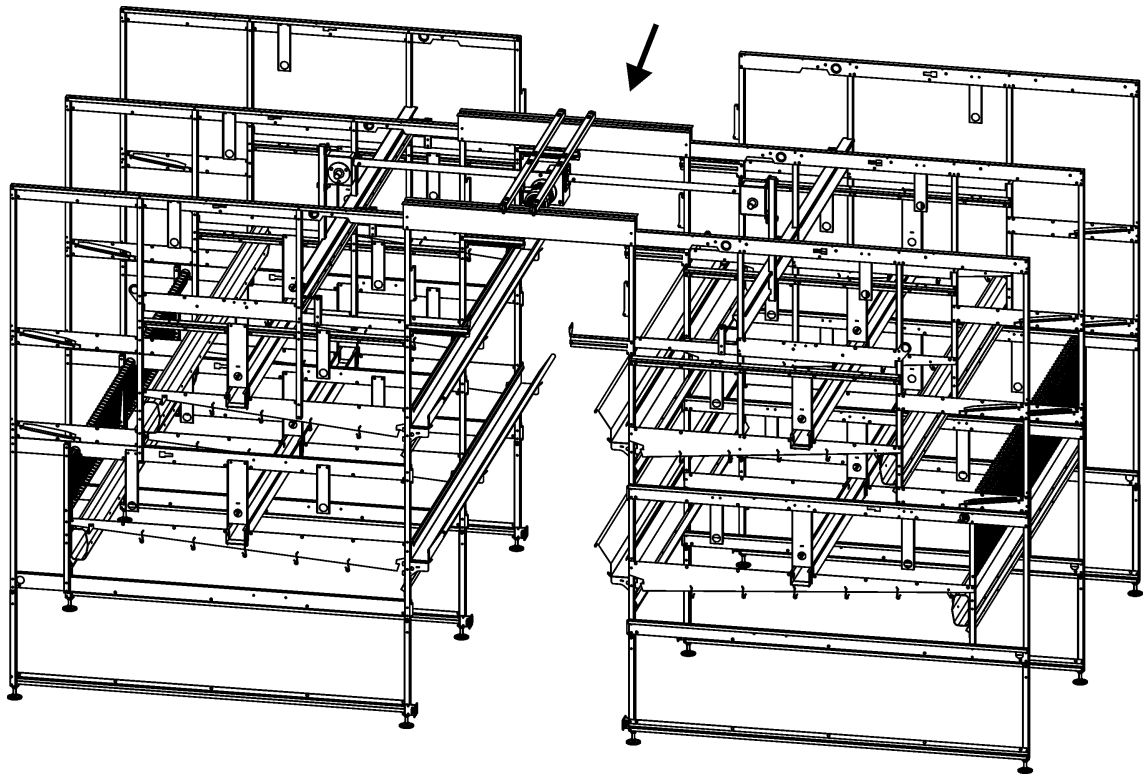
10.1.2 Assembling the drive in the middle of the row (double row)

Important:

If a drive for ejection mechanism has to be installed in a double row, it is absolutely necessary to align the two rows **exactly parallelly** to each

Additional cross connectors are to be installed at **both row ends**.

Described below: 37-97-5900 drive EWA12 cpl f/eject.mechan. double row NAT-60/ BD-C2+

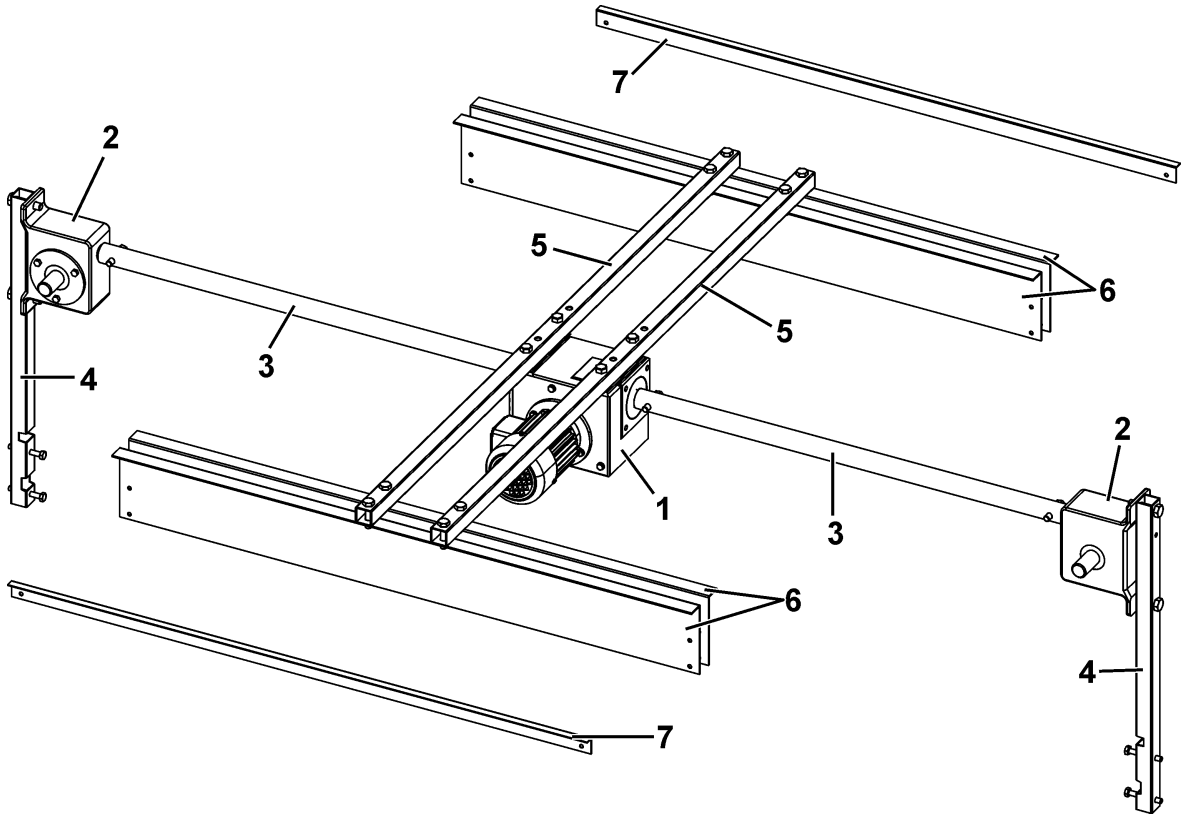


Pos.	Qty.	Code no.	Description
		37-97-5900	drive EWA12 cpl f/eject.mechan. double row NAT-60/BD-C2+
consisting of:			
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	2	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
3	2	83-04-2464	tube 1"x 800 f/connect. drive/ gearbox f/eject. mechan. NAT60
4	2	83-04-2478	brace at side member BD-C2+ for worm gear pair

Pos.	Qty.	Code no.	Description
5	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
6	4	83-04-2476	cross connector dbl f/ejection mechanism NAT-60/BD-C2+
7	4	83-04-2600	cross connector dbl for row end NAT-60/BD-C2+

+ screws, nuts and spring washers

10.1.2.1 Component parts of drive for ejection mechanism (EWA double row)



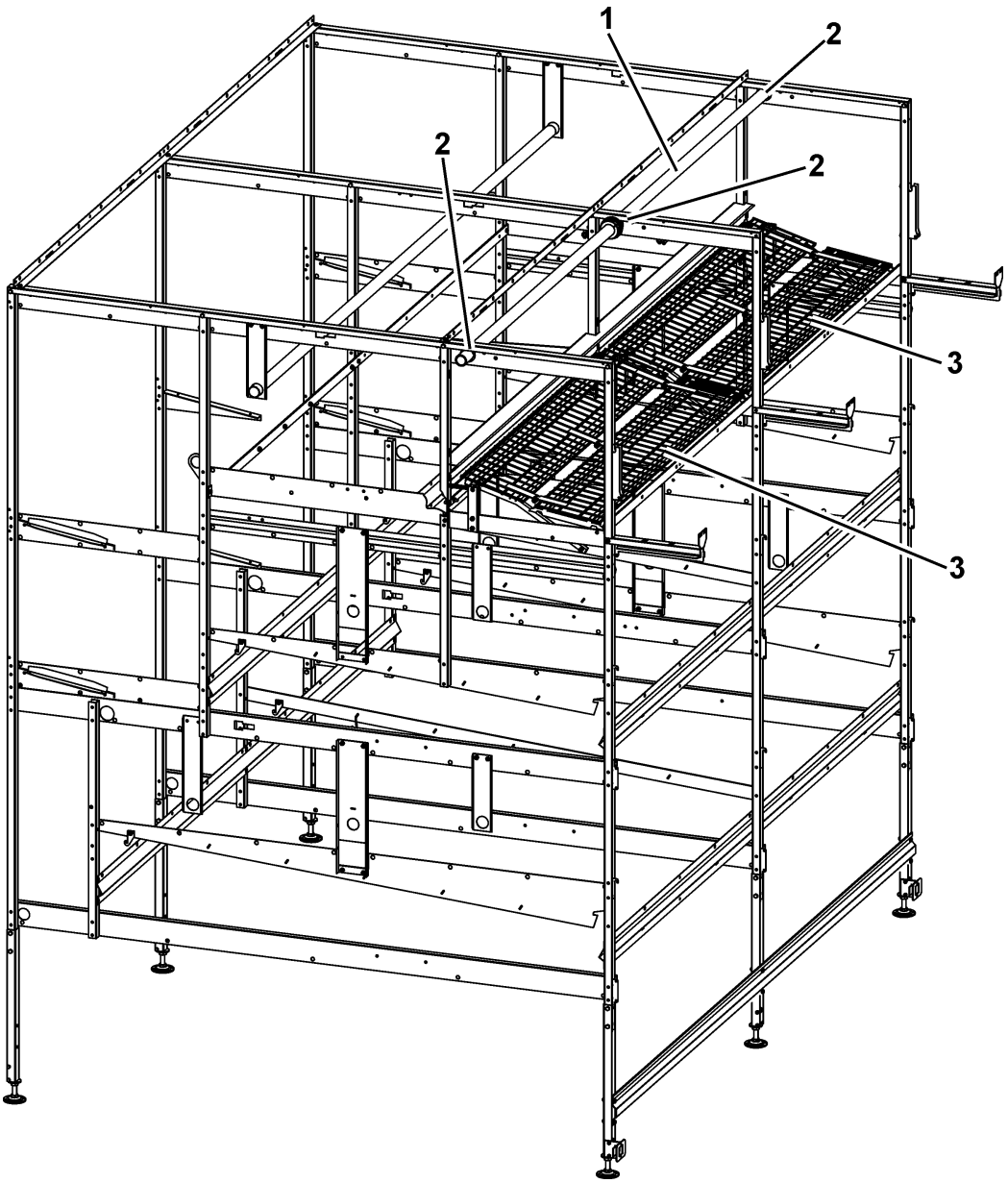
Pos.	Qty.	Code no.	Description
		37-97-5900	drive EWA12 cpl f/eject.mechan. double row NAT-60/BD-C2+
consisting of:			
1	1	37-97-4806	winch motor 400V EWA-12 4,3rpm 70Nm shaft 06 f/eject. mechan.
2	2	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
3	2	83-04-2464	tube 1"x 800 f/connect. drive/ gearbox f/eject. mechan. NAT60
4	2	83-04-2478	brace at side member BD-C2+ for worm gear pair
5	2	83-04-2477	cross bar for motor suspension ejection mechanism NAT-60/BD-C
6	4	83-04-2476	cross connector dbl f/ejection mechanism NAT-60/BD-C2+
7	4	83-04-2600	cross connector dbl for row end NAT-60/BD-C2+

10.1.2.2 Screwing of the component parts for ejection mechanism for double row

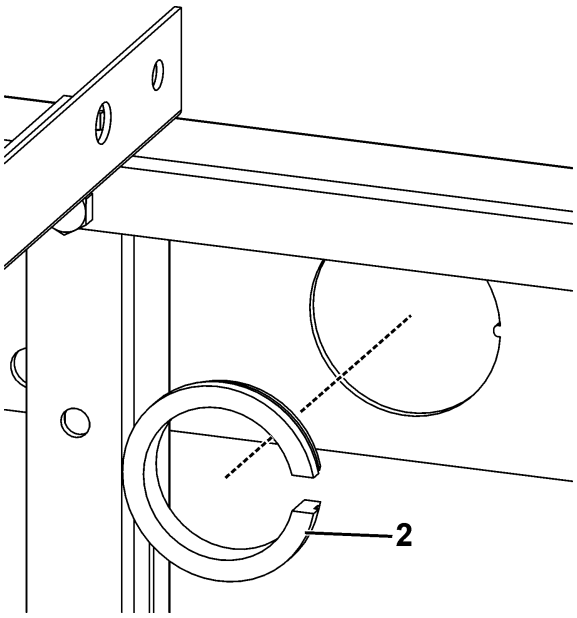
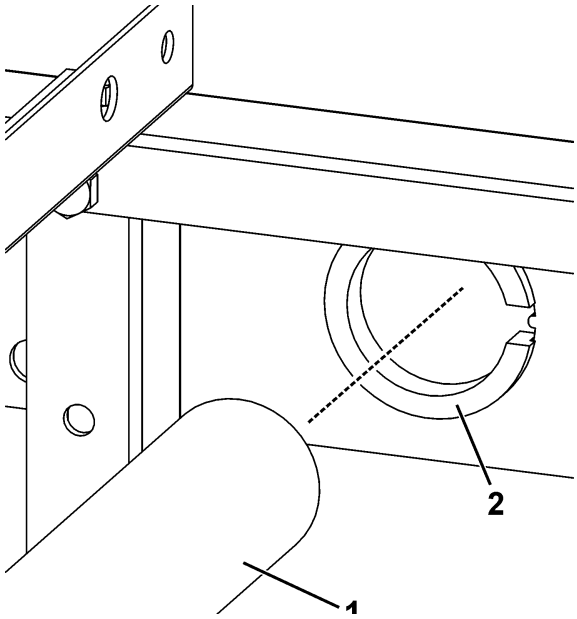
	Screwing of the component parts is the same as for the drive for the ecjection mechanism single row, described in chapters 10.1.1.2 to 10.1.1.5 .

Regarding the fastening of the nest floor drive tubes to the worm gear pair see chapter: 10.1.3.2 .

10.1.3 Nestfloor drive tubes



Pos.	Qty.	Code no.	Description
1		99-40-3813	tube 1"x6000 galv. DIN 2440
2	3	36-00-6206	bush PA6 for tube 1"
3	2	83-01-1388	tiltable bottom cpl. BD-C2+

Insertion of the bush PA6 for tube 1"	Insertion of the tubes 1"
	

Pos.	Qty.	Code no.	Description
1		99-40-3813	tube 1"x6000 galv. DIN 2440
2	3	36-00-6206	bush PA6 for tube 1"

10.1.3.1 Connection of the tubes

Note:

When connecting two 1" tubes by means of couplings, make sure that the couplings do not obstruct the further assembly of the nest back walls and cable coiling.

In the following areas of a section **no** couplings for 1" tubes may be mounted:

- at a distance of 10 cm from the left- and right-hand side of each cage stand,
- within a 10 cm wide area in the middle of each nest hole.

Later on,

- this is where the nest back walls and rope coils are fastened.

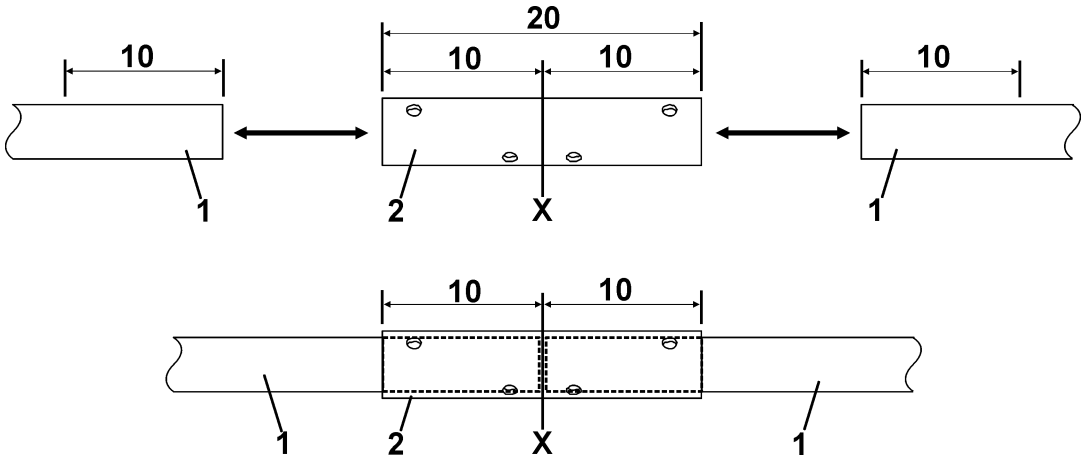
Procedure:

- push the coupler (2) 10 cm on the tube ends to be connected,

- take the drill holes in the coupler tube as a pattern and drill the holes respectively into the inner tubes 1”.

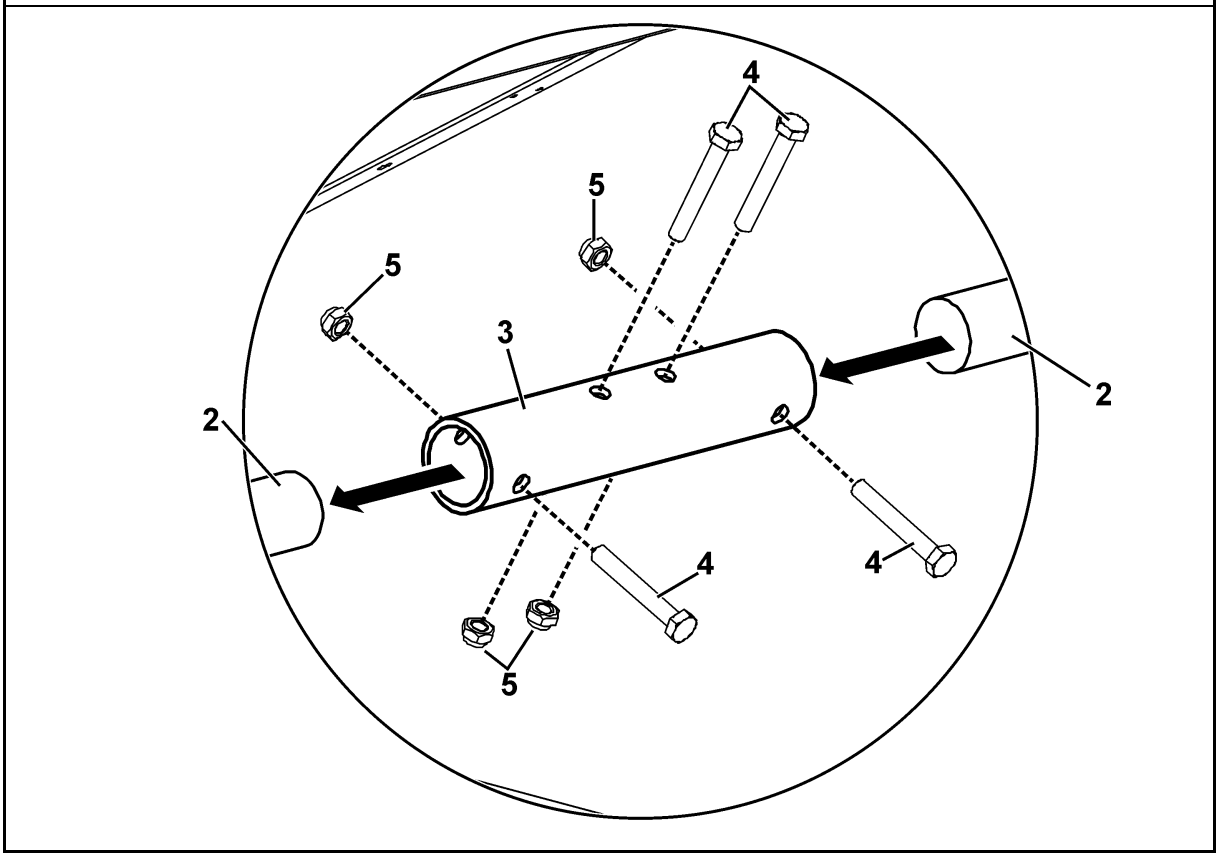
	For drilling the tubes 1” use a drill Ø 8,5 mm.

	Note: The tube ends (1) have to meet exactly in the centre **(X)** of the coupling tube (2).



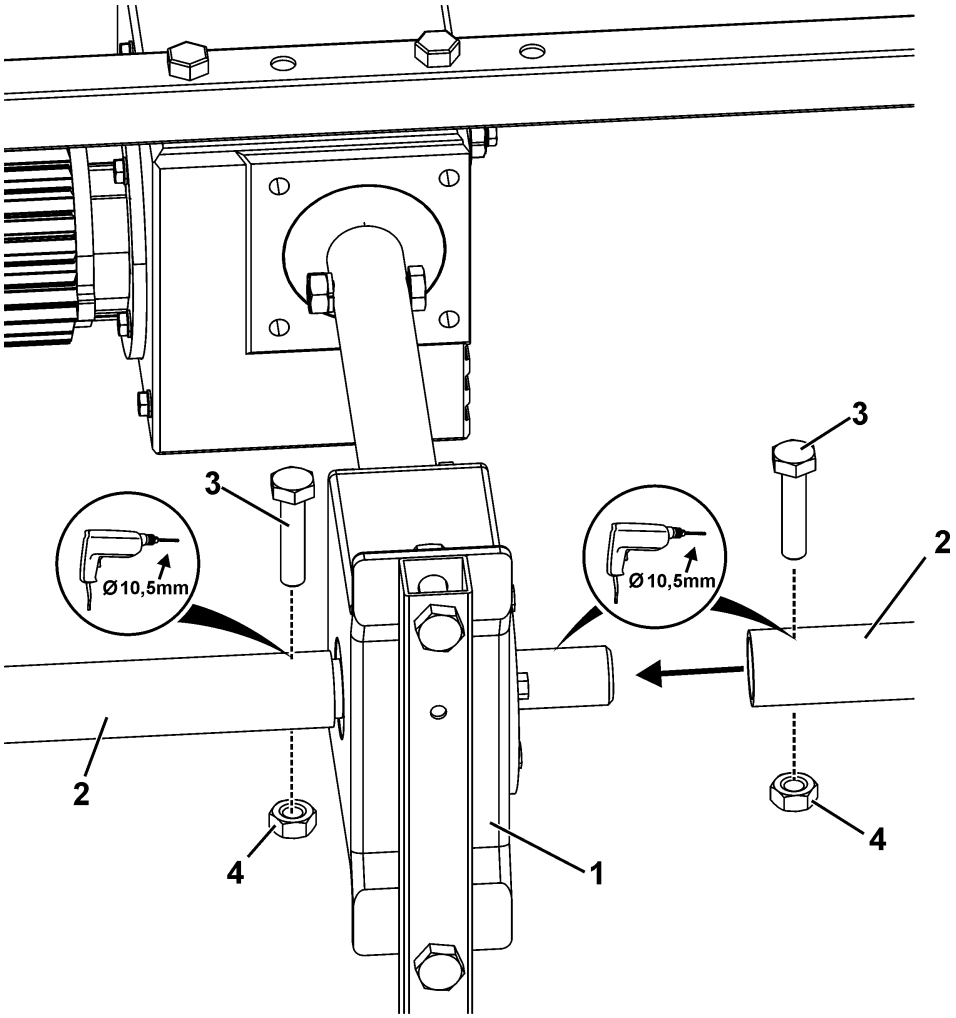
Pos.	Qty.	Code no.	Description
1		99-40-3813	tube 1"x6000 galv. DIN 2440
2	1	36-00-4030	coupler for tube 1" BD-C2+
X			middle of the coupler for tube 1" BD-C2+

Connection of the 1" tubes



Pos.	Qty.	Code no.	Description
2		99-40-3813	tube 1"x6000 galv. DIN 2440
3		36-00-4030	coupler for tube 1" BD-C2+
4		99-10-1265	hexagon head screw M 8x55 galv. DIN 933 8.8
5		99-20-1064	self-locking counter nut M 8 DIN 985-6 galv.

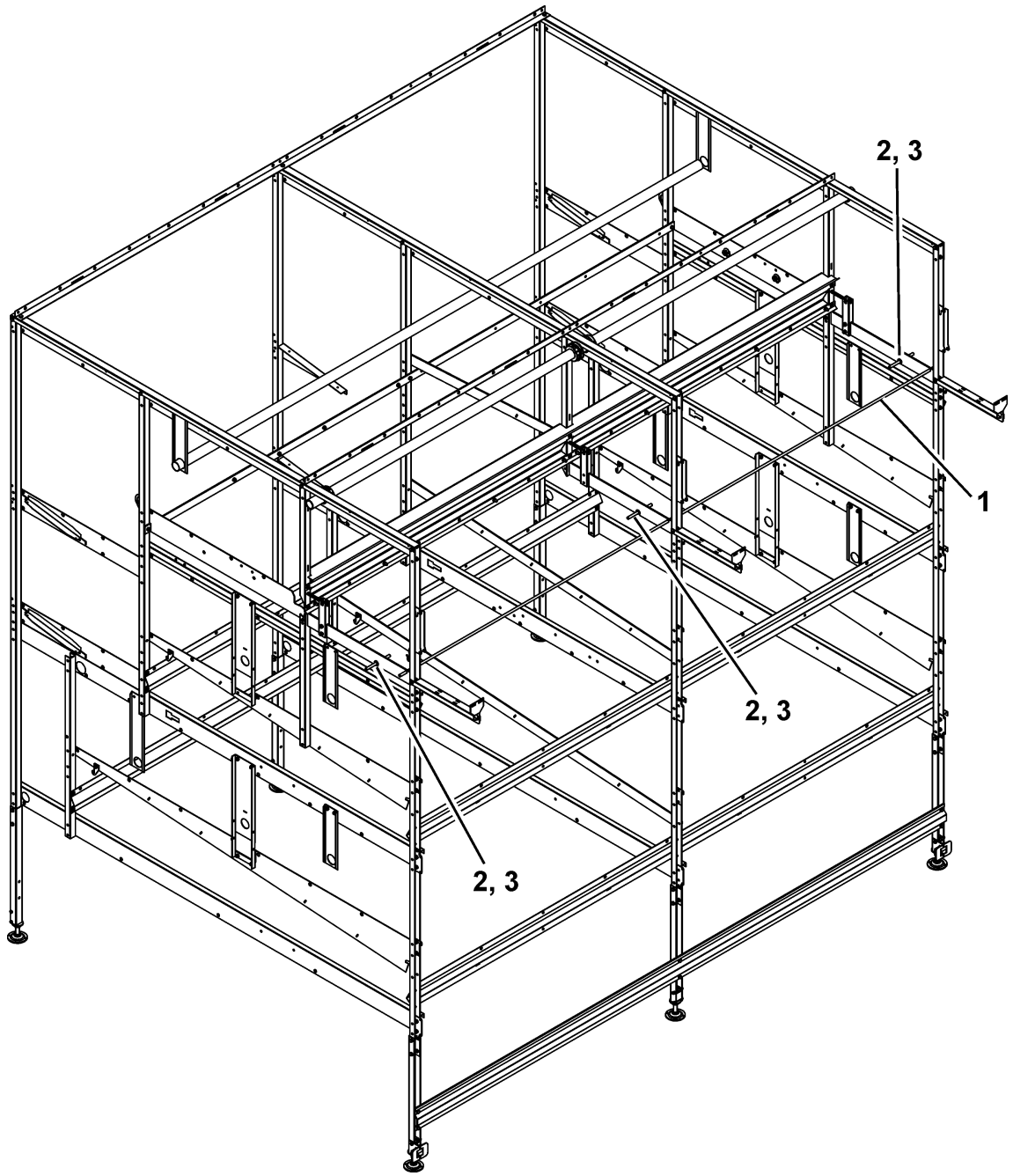
10.1.3.2 Fixing of the nestfloor drive tubes to the drive



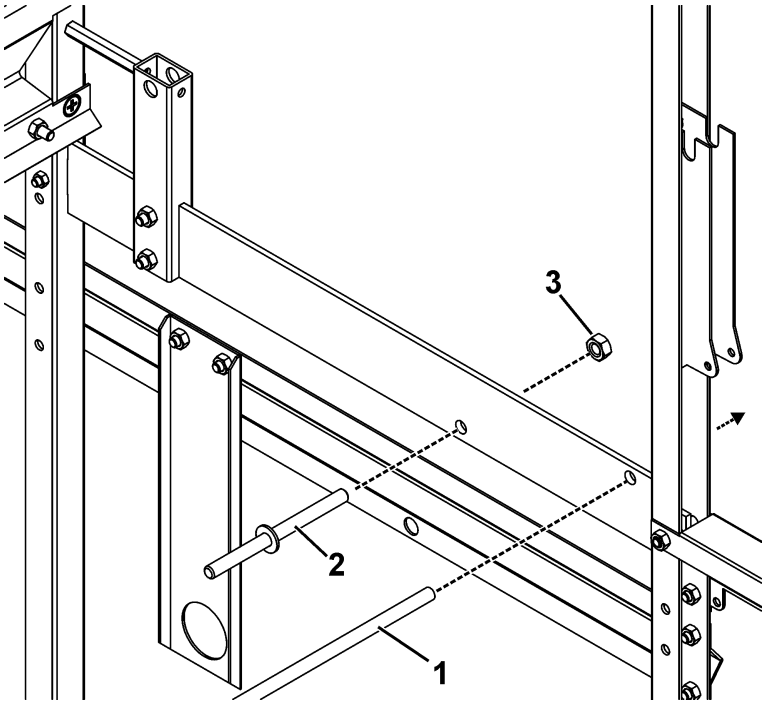
Pos.	Qty.	Code no.	Description
1	1	37-97-4807	worm gear pair 200Nm shaft 06 f/ejection mechanism NAT-60
2		99-40-3813	pipe 1"x6000 galv. DIN 2440
3	2	99-10-1250	hexagon head screw M 10x 45 galv. DIN 558
4	2	99-20-1029	hexagon nut M 10 galv. DIN 555

10.1.4 Assembly of the nest bottom

10.1.4.1 Insertion of the threaded rods and supporting rods for the nest bottom inlay



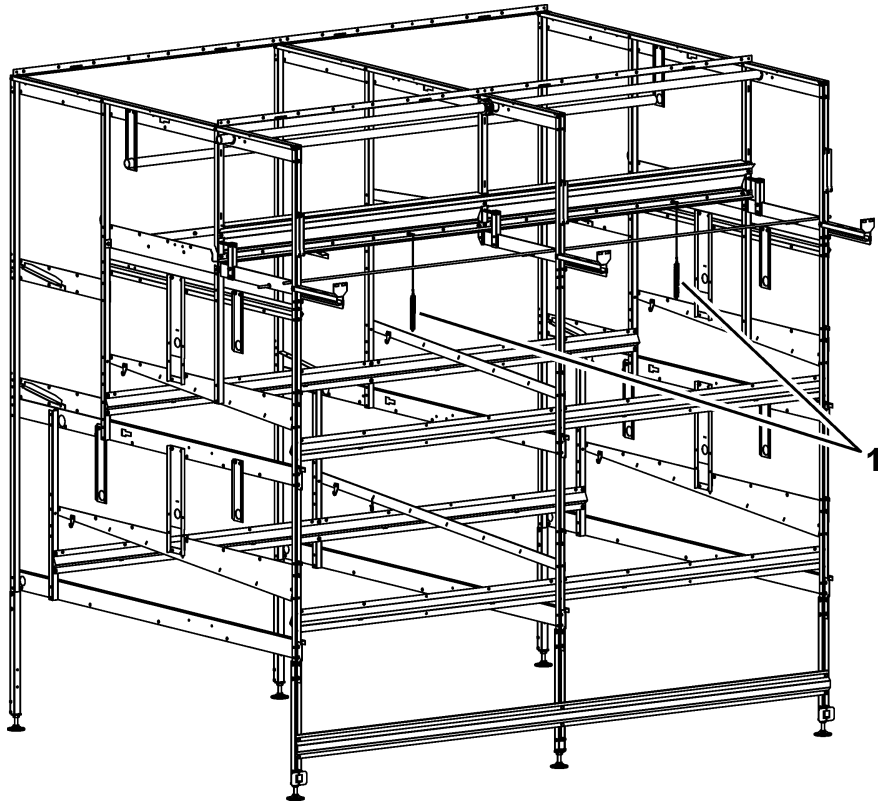
Pos.	Qty.	Code no.	Description
1		37-46-3708	rod 8x5000
2	3	83-01-4230	rod threaded M8 with washer
3	3	99-10-1040	hexagon nut M 8 galv



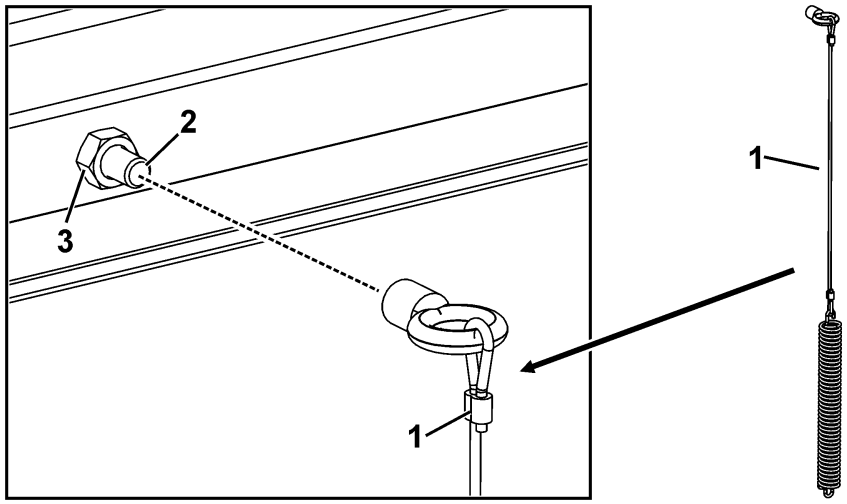
position numbers: see previous page

10.1.4.2 Installing the wire ropes for the nest floor resetting mechanism

One wire rope is installed in every nest hole.



During the assembly of the approach gratings in front of the nest, every "retainer for approach grating" was screwed to the "side rail 2412 MB NAT-60" by means of 4 mushroom head square neck bolts M6x16 and 4 hexagon head nuts M6.



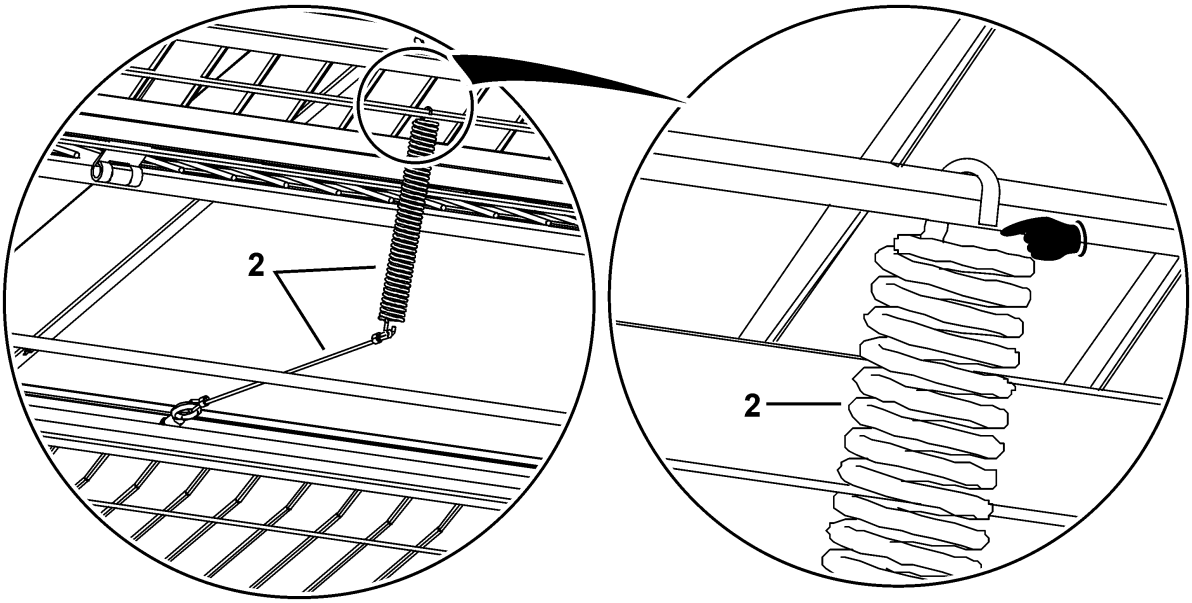
The overlapping threads of **one** of the mushroom head square neck bolts inside the respective nest holes are now needed for the attachment of the wire ropes for the nest floor resetting device.

Pos.	Qty.	Code no.	Description
1	2	83-00-7148	wire rope 1 mm SST with tension spring and nut M6
2	2	99-10-1602	mushroom head square neck bolt M 6x16 DIN 603 galv.
3	2	99-10-1045	hexagon nut M 6 galv. DIN 934-8

10.1.4.3 Hooking the wire rope for nest floor resetting mechanism into the tilting floor

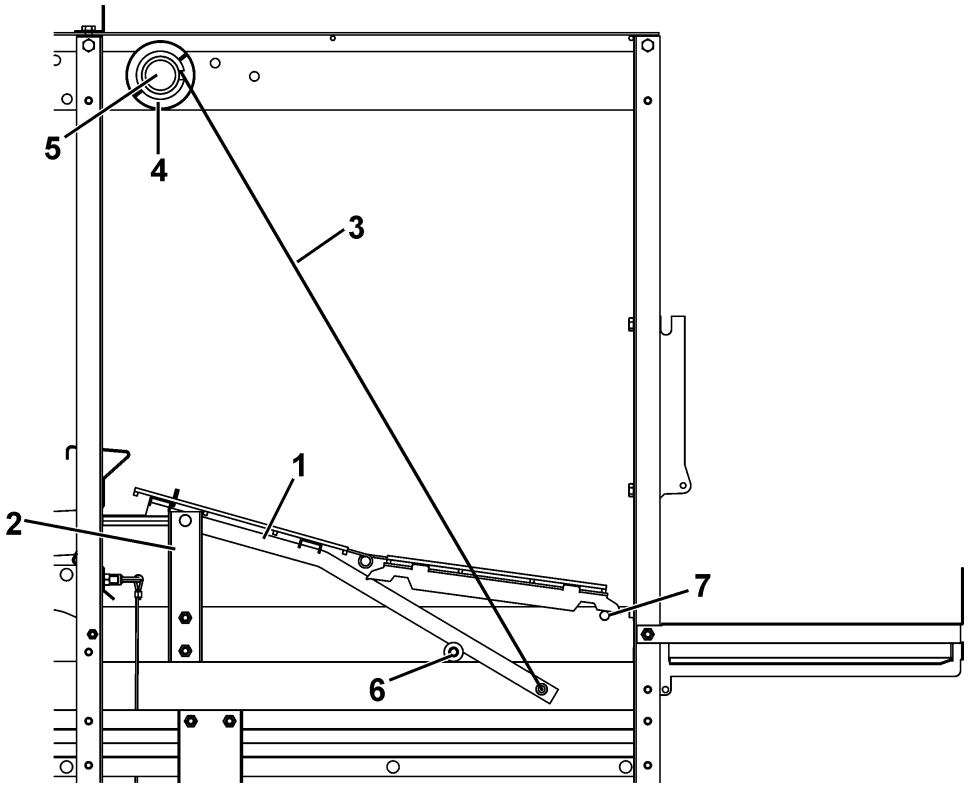
Once all tilting floors are installed and fixed to the nest bottom bearing, the afore mounted wire rope for the floor resetting device at the nest floor can be hooked in.

	Note: Make sure that the opening of the hooks **point towards the outside of the section**. Tension springs that are hooked-in the other way around, could become loose once the tilting floor is lifted and could thus restrict the functionality of the tilting floor.

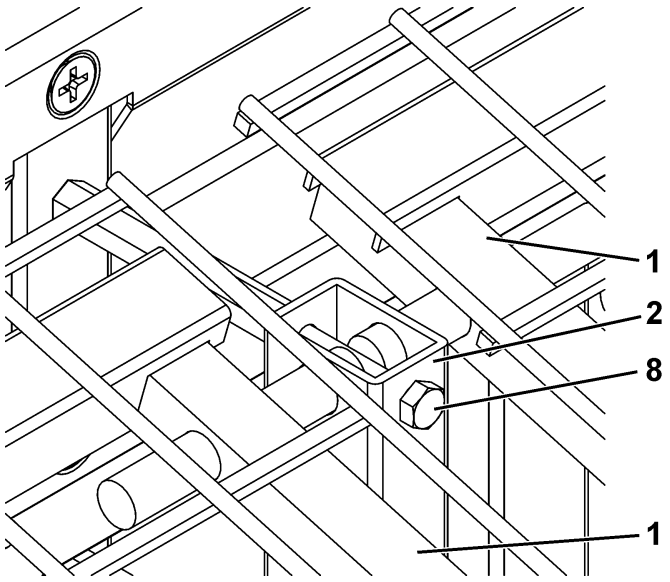


Pos.	Qty.	Code no.	Description
1	4	83-01-1388	tiltable bottom cpl. BD-C2+
2	4	83-00-7148	wire rope 1 mm SST with tension spring and nut M6

10.1.4.4 Insertion of the floor units and towing ropes for the nest floor drive



Pos.	Qty.	Code no.	Description
1	2	83-01-1388	tiltable bottom cpl. BD-C2+
2	3	83-03-9695	bearing for bottom of nest NAT-60 BD-C2+
3	4	83-01-1984	traction rope 750lg 1.50mm SST with 2 tappets
4	8	83-00-9884	half PA of adjusting ring for winding of wire BD-C2+/NAT-Nova
5		99-40-3813	tube 1"x6000 galv. DIN 2440
6	3	83-01-4230	rod threaded M8 with washer
7		37-46-3708	rod 8x5000
8		99-10-3824	Hexagon head screw M 5x 40 DIN 558 galv



The inserted tiltable floors are fixed to the nest floor bearing by means of hexagon head screws M5x40.

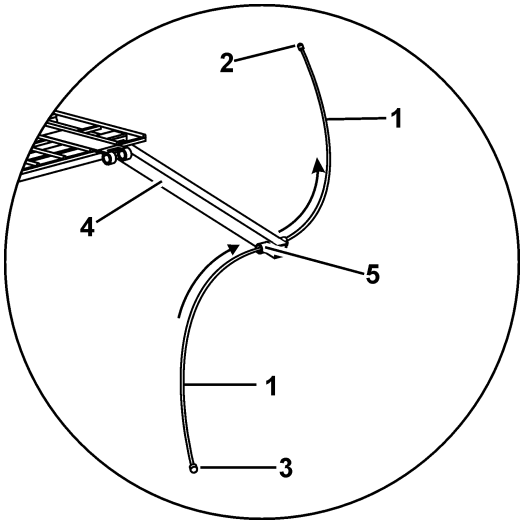
The heaxagon head screw is screwed into the distance tube.

10.1.4.5 Fixing the traction ropes to the tilting floor

The smaller tappet (2) of the traction rope serves for anchoring it in the halves of the nest floor drive. The other large tappet (3) anchors the traction rope to the floor tappet (4).

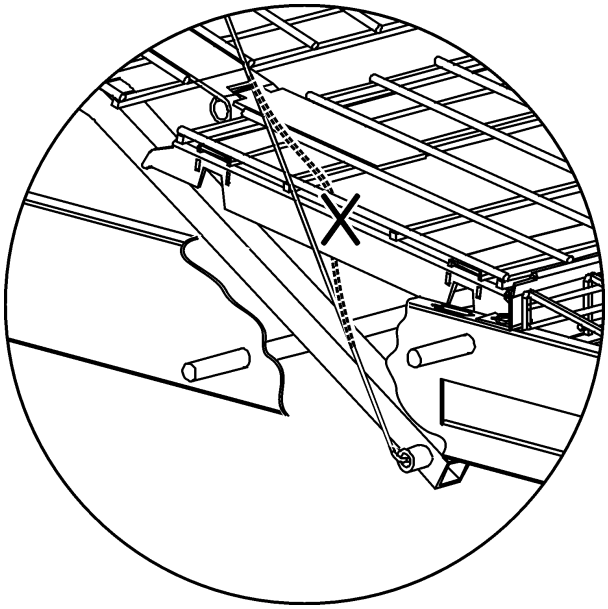
Procedure:

- Start with inserting the traction rope (1) with the smaller tappet (2) from **inside to outside** through the welded tube sleeves (5) of the two floor tappets (4) of a tilting floor.



Pos.	Code no.	Description
1-3		see top drawing
2		floor tappet
3		tube sleeve

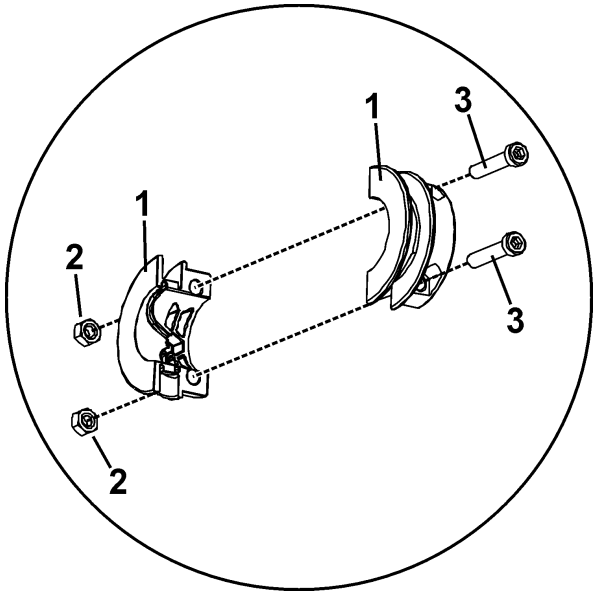
- Pull the rope through the sleeve on its entire length. The large tappet (3) has to be close to the tube sleeve (5).
- Make sure the rope is placed **between** the tilting floor and the stillage. **It must not be pulled through the mesh of the rear part of the floor.**
- Continue like this until 2 traction ropes are inserted in each tilting floor.



10.1.4.6 Fixing the traction ropes at the tube 1” for nest floor drive

2 bearing shells PA for winding of wire are required per nest hole

Pos.	Qty.	Code no.	Description
	1	36-00-6240	bearing shell PA cpl. for winding of wire BD-C2+/NAT-Nova
1	2	83-00-9884	half PA for winding of wire BD-C2+/NAT-Nova
2	2	99-10-1045	hexagon nut M 6 galv. DIN 934
3	2	99-10-3936	hexagon socket head cap screw M 6x35 DIN 912-8.8 galv

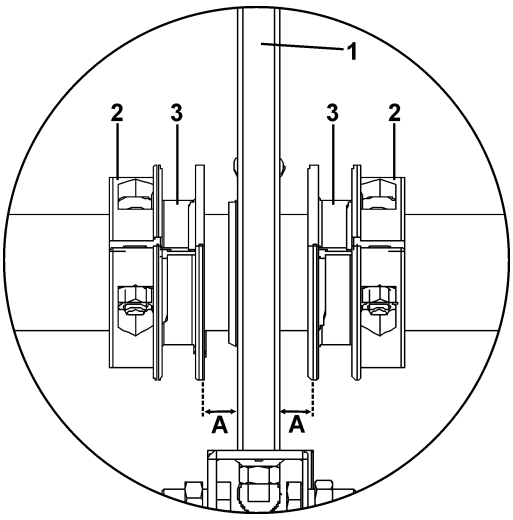


10.1.4.7 Positions of bearing shells within the nest holes

The adjusting ring halves have a fastening side (2), at which the half rings are screwed together and a side with tread surface for winding of the wire (3).

The bearing halves have to be mounted onto the tubes of the nest floor drive that the sides for the rope wind-up (3) lies next to the stand (1) at a distance of approx. 1-2 cm (A).

top view



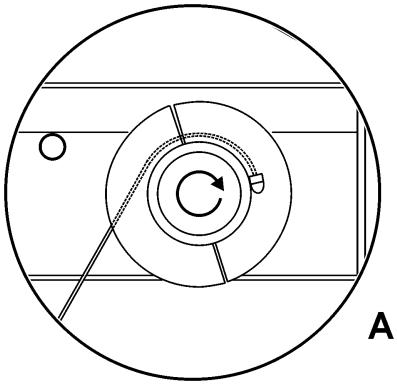
position numbers see the following page

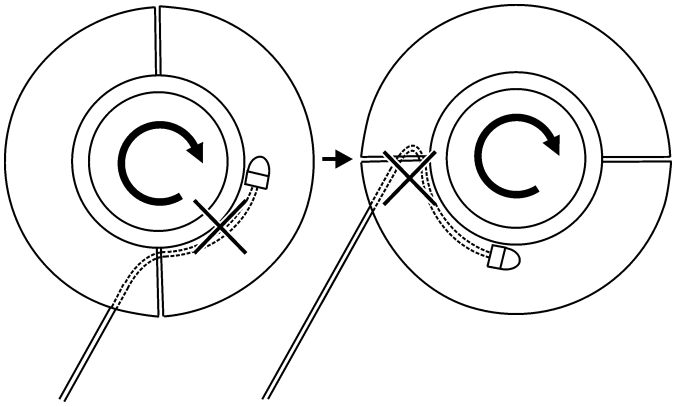
Pos.	Qty.	Code no.	Description
1	1		stillage
2			fastening side of the bearing halves
3			surface for the rope wind-up of the bearing half

10.1.4.8 Placing the traction rope tappet into the half

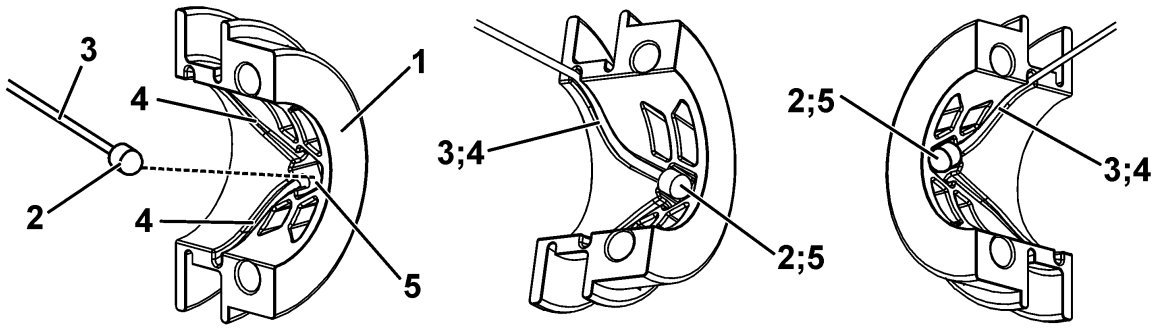
Important:

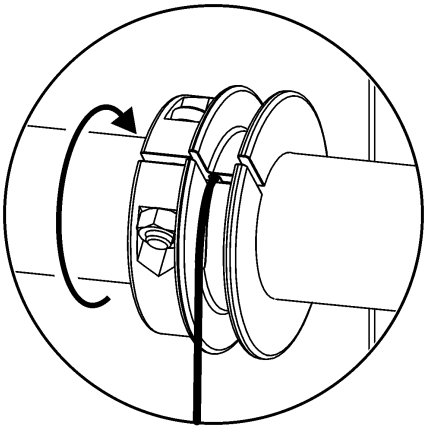
For the correct assembly of the end pegs of the traction rope into the bearing halves, observe the running direction of the nest floor drive.

Correctly mounted traction rope:	
	**Important:** To ensure a faultless functioning of the rope wind-up, the traction ropes must be inserted in the halves and screwed together **from above**, over the tubes (1). If this is **not carried out correctly**, the wire ropes bend and are thus bound to **tear** if used for a longer time! **Arrow= direction of rotation of the tube**

Falsely mounted traction rope:	
	If the sense of rotation of the nest floor drive (see arrow) is the same, the traction ropes may bend and thus tear. **Bent traction ropes must be replaced, in any case!**

Insertion of the traction rope end pegs:





- The bearing halves (1) have a groove (5) on the inside into which the respective end pegs (2) of the traction ropes (3) can be inserted.
- After you inserted the peg into the grove and the wire rope into the upwards-running rope channel (4), the half is set onto the 1" tube of the nest floor drive.

Note:

Make sure that the wire rope does not slip out of the rope guide!

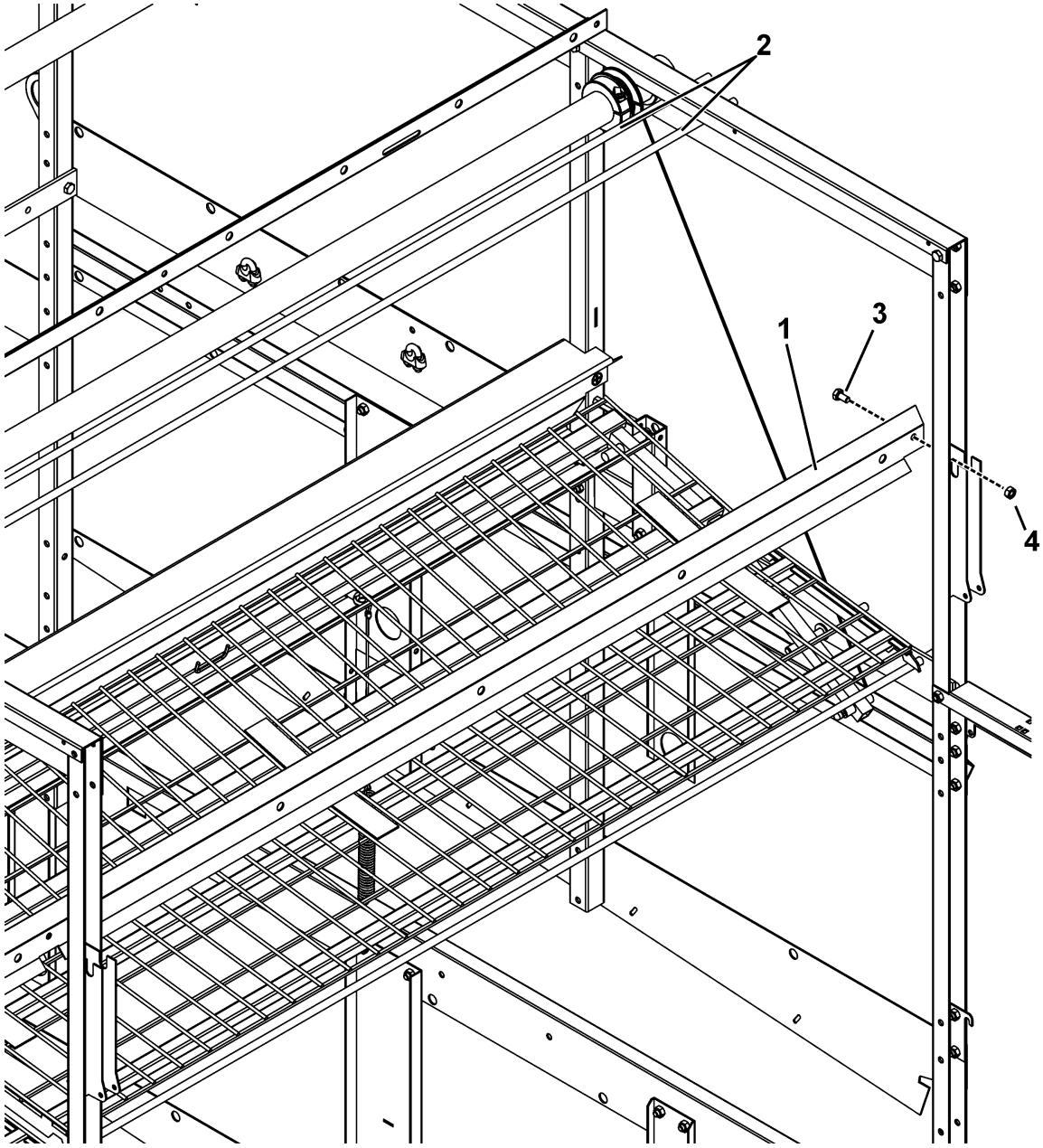
- Now set the 2nd half of the bearing shell onto the 1" tube and screw it to the first shell in which the traction rope is fastened.

Do not fully tighten the screws yet, but turn the bearing shell in the direction of the nest floor drive, until the traction rope is tensioned.

- Tighten all screws of the bearing shell.

10.1.5 Assembly of the nest back walls and sheet metal partitions

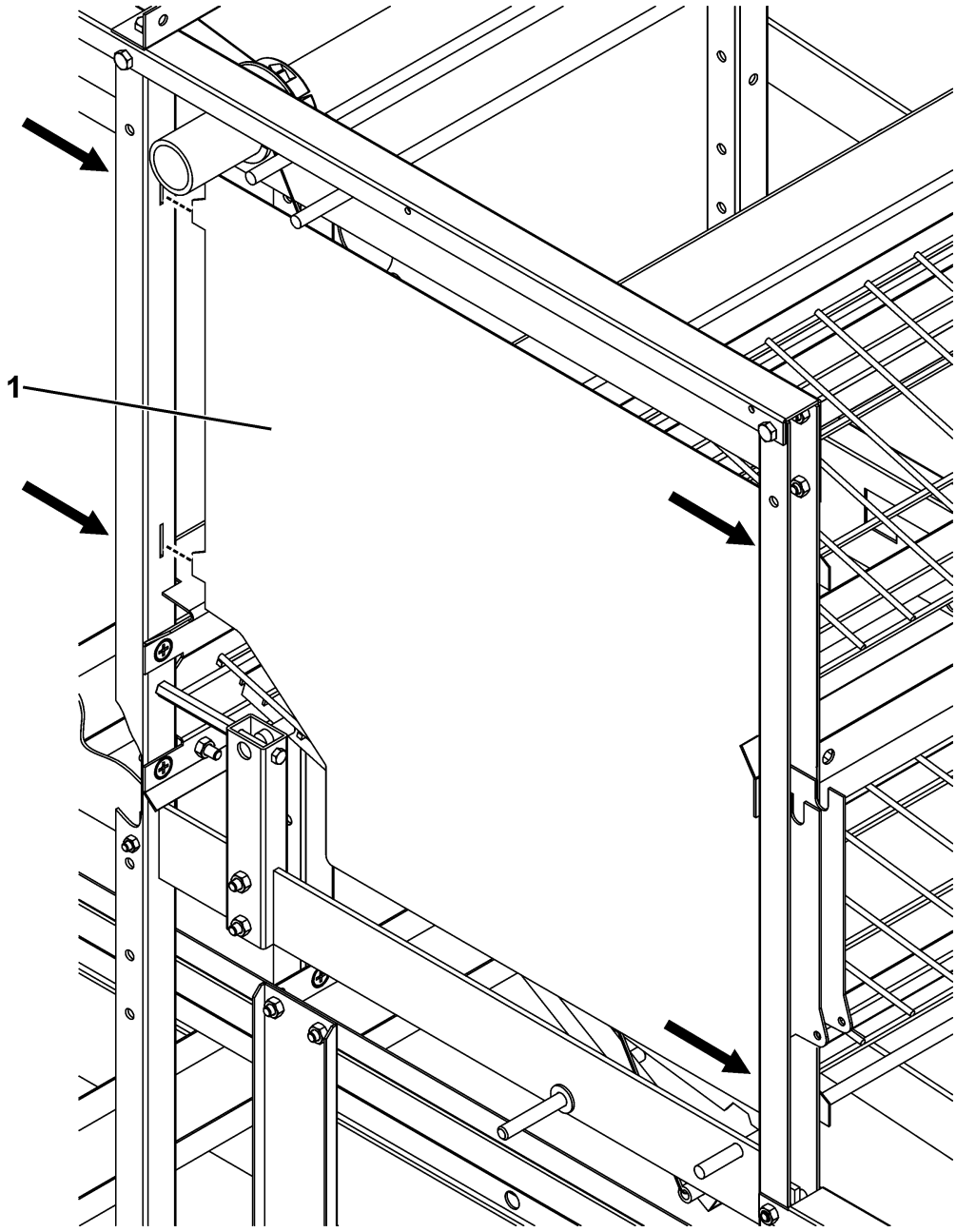
10.1.5.1 Installation of the rods and fastening rail for the back wall



Pos.	Qty.	Code no.	Description
1	1	83-03-9734	fastening rail 2412 for back wall nest NAT-60 BD-C2+
2		37-46-3708	rod 8x5000
3		99-10-1110	hexagon head screw M 6x12 galv.
4		99-10-1045	hexagon nut M 6 galv. DIN 934-8

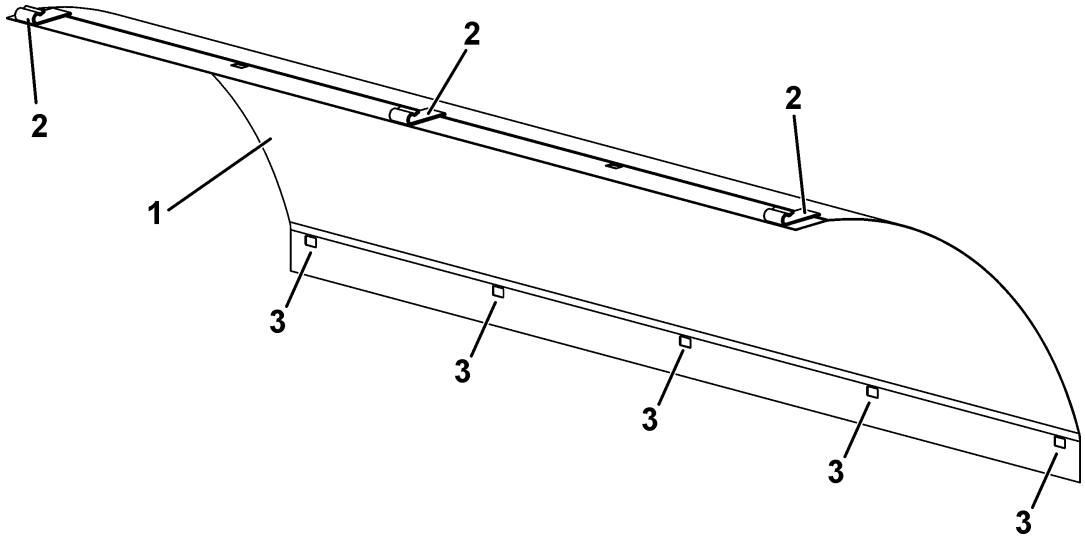
10.1.5.2 Insertion of the sheet metal partitions

The sheet metal partitions are inserted into the cage stands at the positions marked with an arrow.



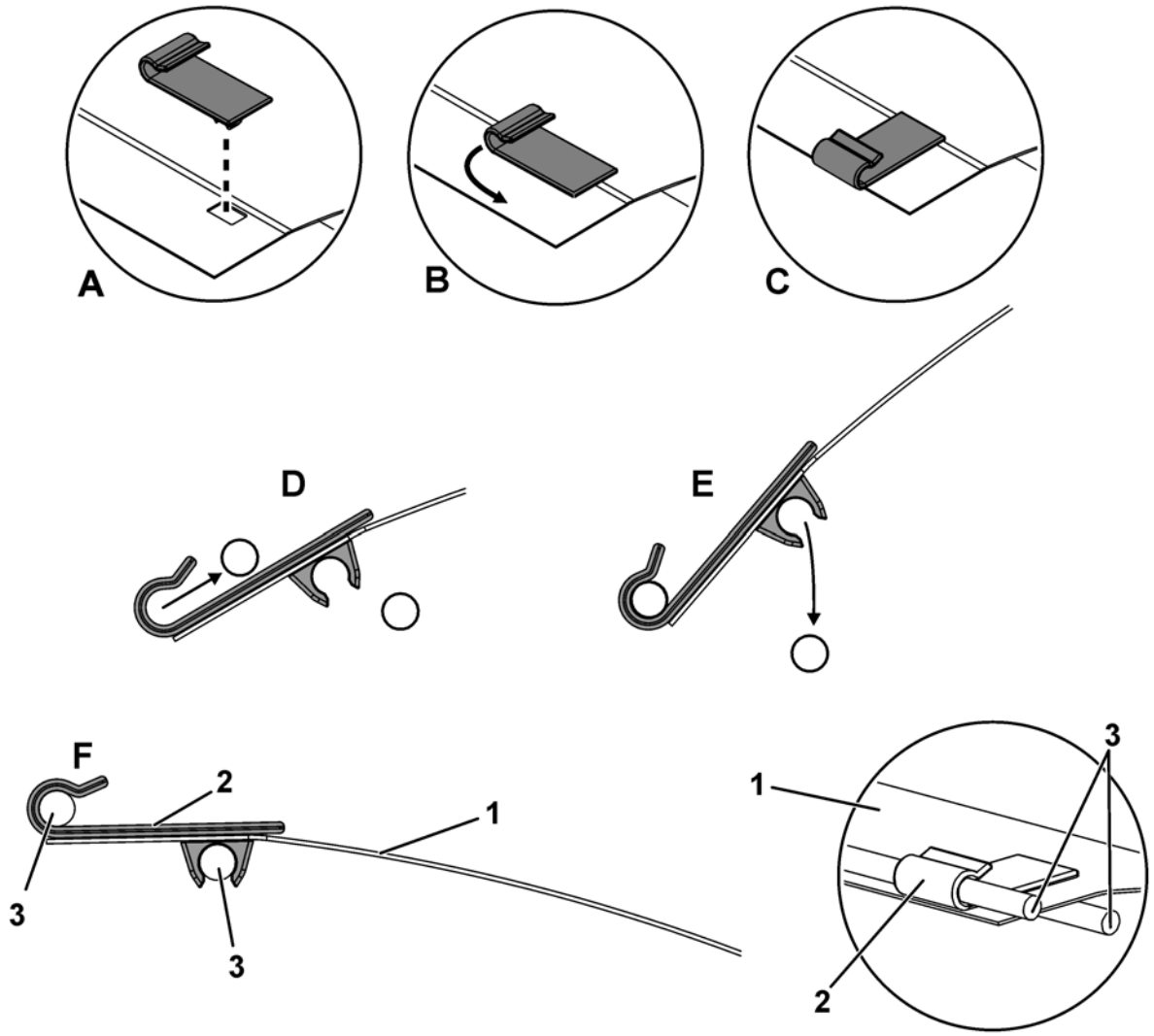
Pos.	Qty.	Code no.	Description
1	1	83-03-9712	sheet metal partition sgl. pluggable for nest NAT-60 BD-C2+

10.1.5.3 Insertion and fastening of nest back wall



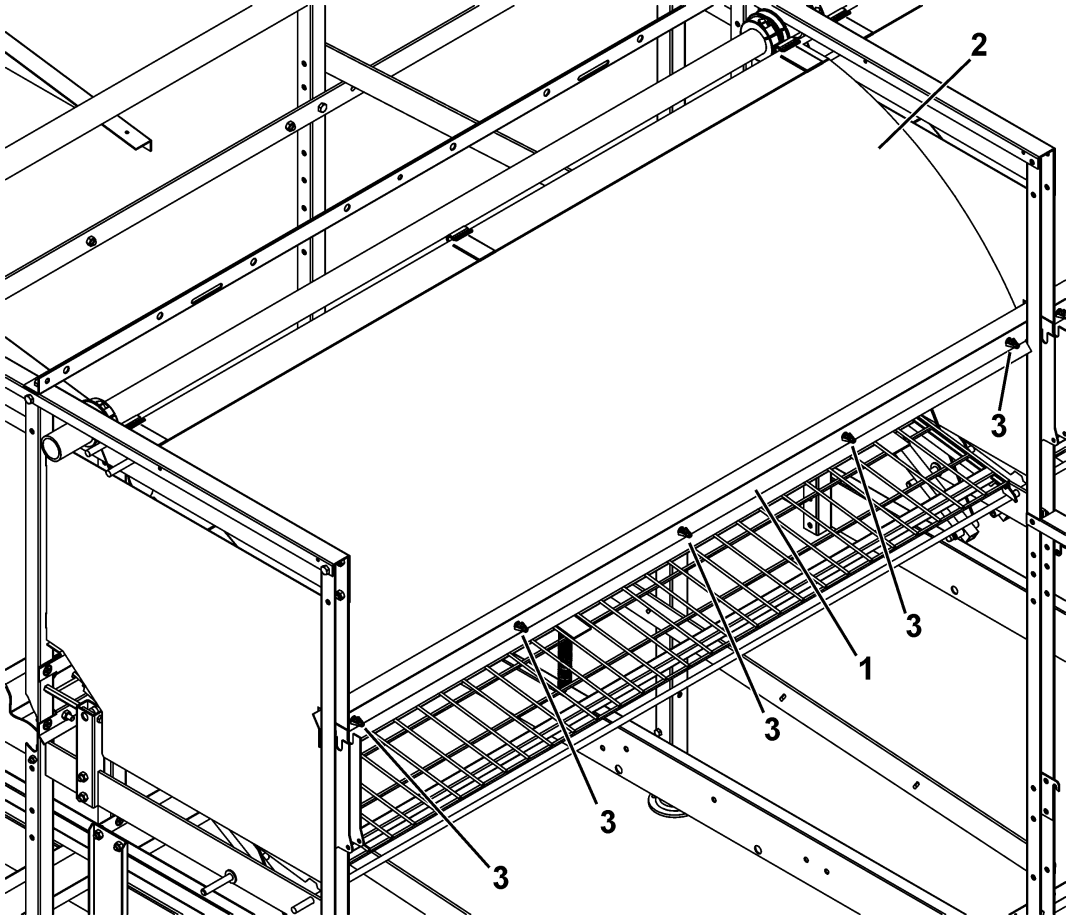
Pos.	Qty.	Code no.	Description
1	1	83-00-5740	back panel 1206 PP per nest hole BD-C2+
2	3	83-01-7442	hook PA at nest back wall BD-C2
3	5		holes for the attachment at the fixation rail

Upper fixing of the back panels to the rods



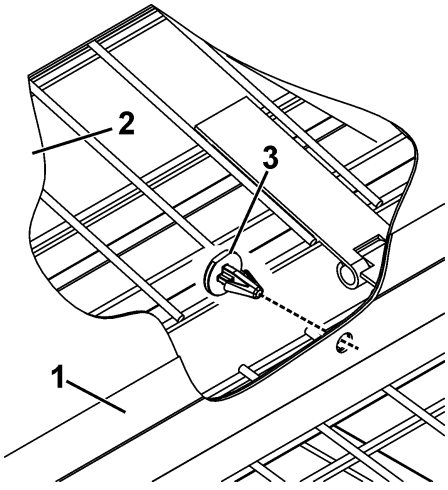
For the upper fixing of the back panel, you need **3 hooks**. (Position at the back panel: refer to the beginning of the chapter)

Pos.	Qty.	Code no.	Description
1	1	83-00-5740	Back panel 1206 PP per nest hole BD-C2+
2	3	83-01-7442	Hook PA at back panel BD-C2
3		37-46-3708	Rod 8x5000



In each nest hole, the back wall is fastened to the "fastening rail" from the inside of the nest by means of 5 fastening buttons.

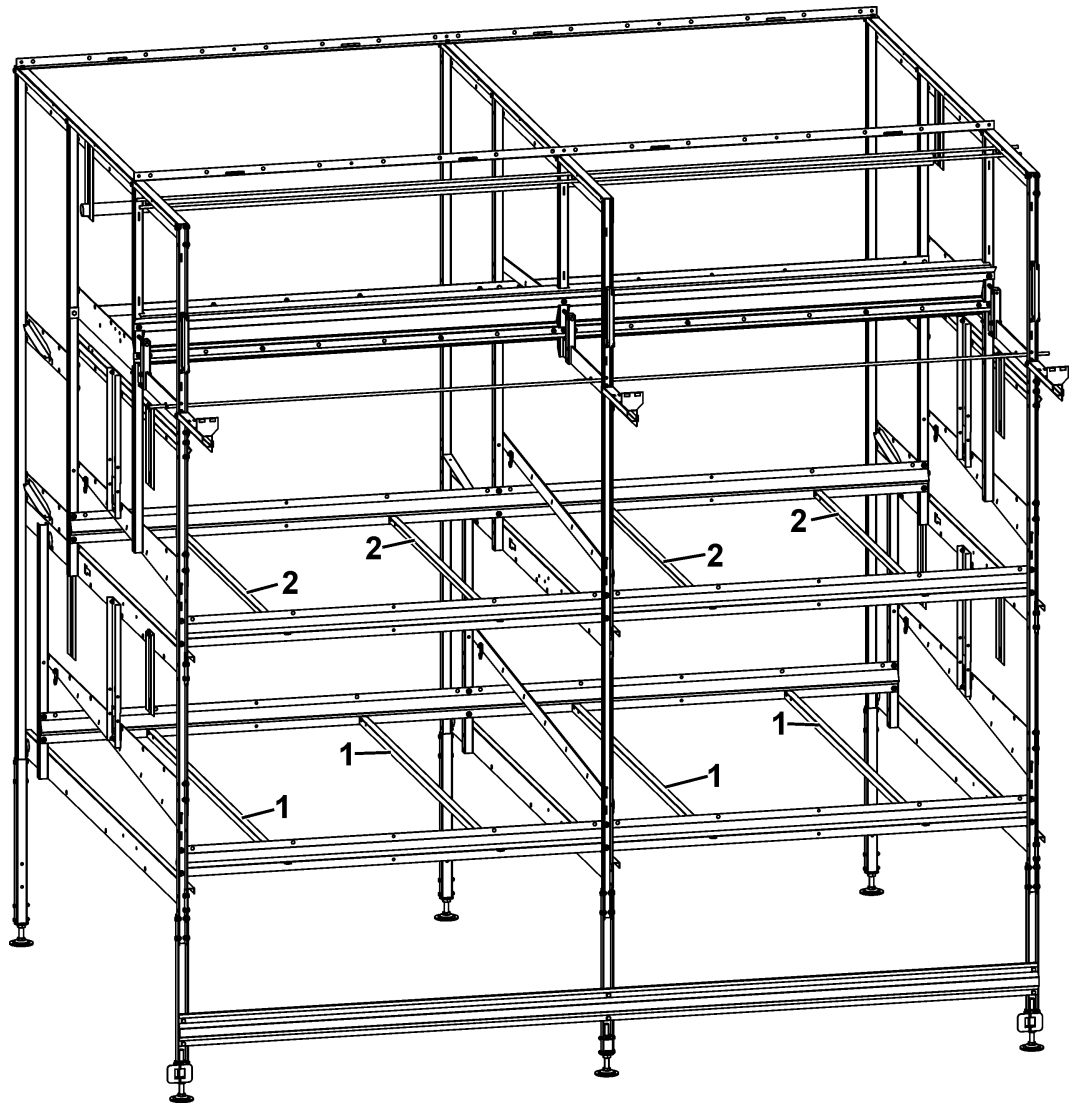
Pos.	Qty.	Code no.	Description
1	1	83-03-9734	fastening rail 2412 for back wall nest NAT-60 BD-C2+
2	2	83-03-9733	back panel 1206 PP per nest hole NAT-60 BD-C2+
3	10	83-01-5968	fastening button PA6.6 for nest curtain



11 Installation of the centre and lower bottom wires

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

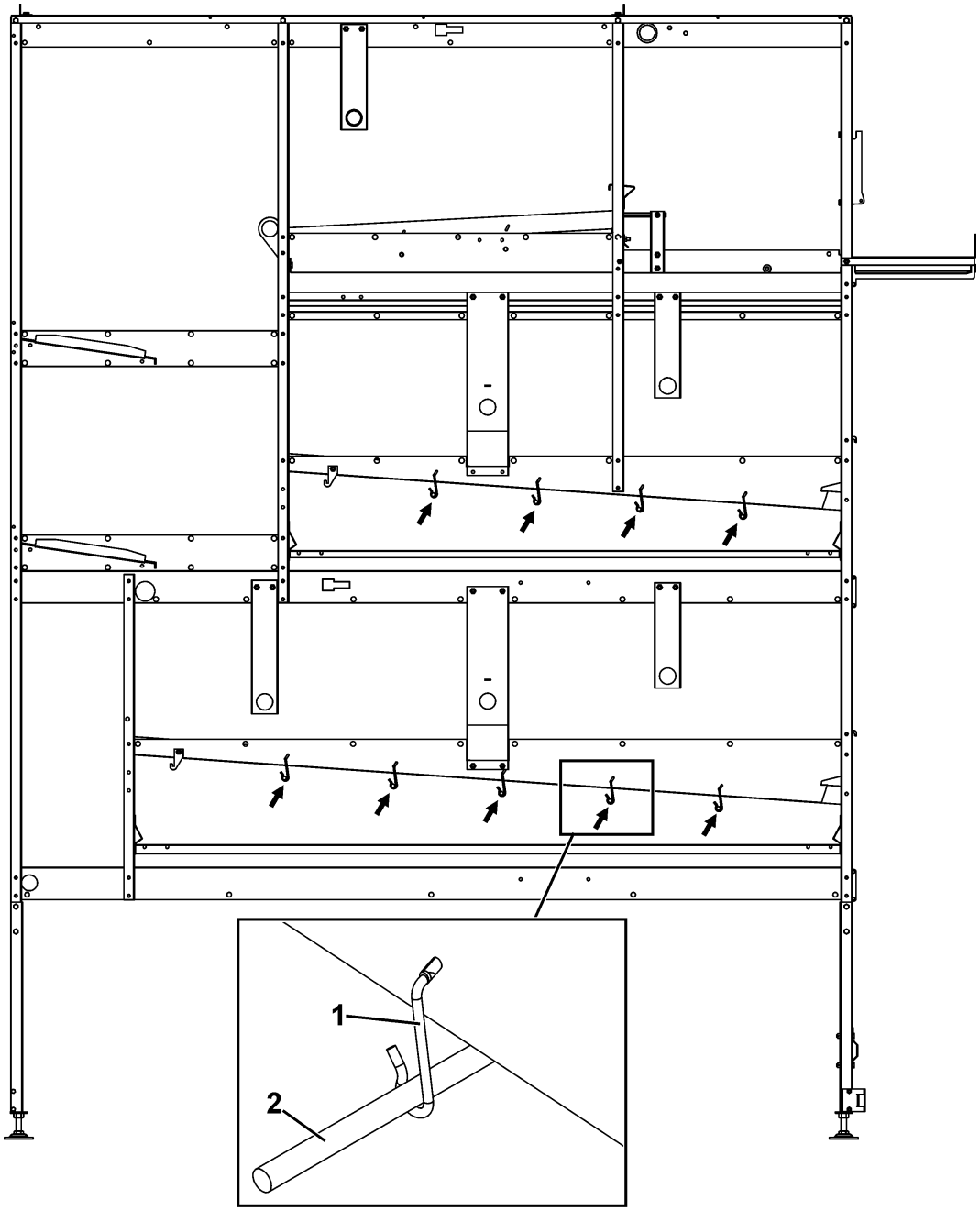
11.1 Insertion of the manure belt supports



Pos.	Qty.	Code no.	Description
1	4	83-03-6605	support for manure belt 1540 NAT-60-1800
2	4	83-03-6613	support for manure belt 1200 NAT-60

11.2 Insertion of wire hooks and rods

Insert a wire hook and a rod Ø8mm at the positions marked with an arrow.



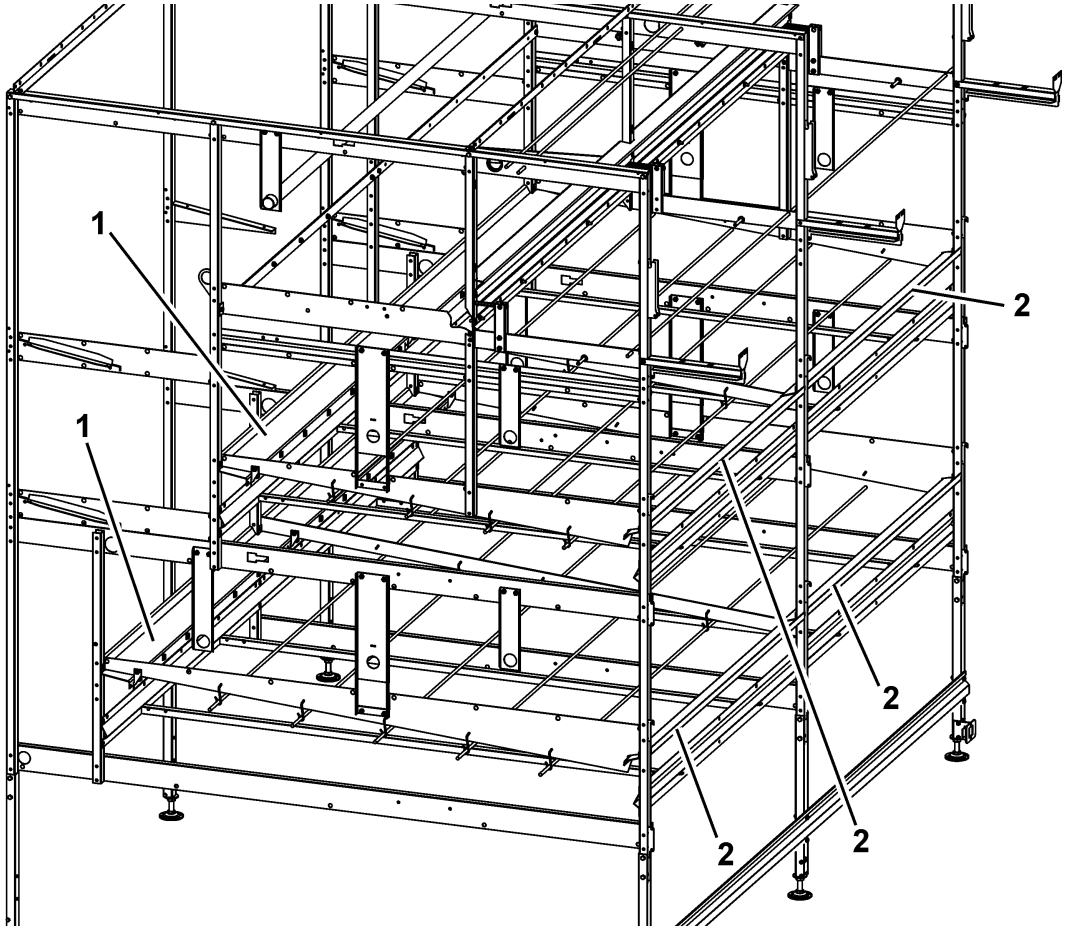
Pos.	Qty.	Code no.	Description
1	18	83-03-9694	wire hook f/bottom wire grille NAT-60
2		37-46-3708	rod 8x5000

11.3 Installation of approach sheets and foot rails

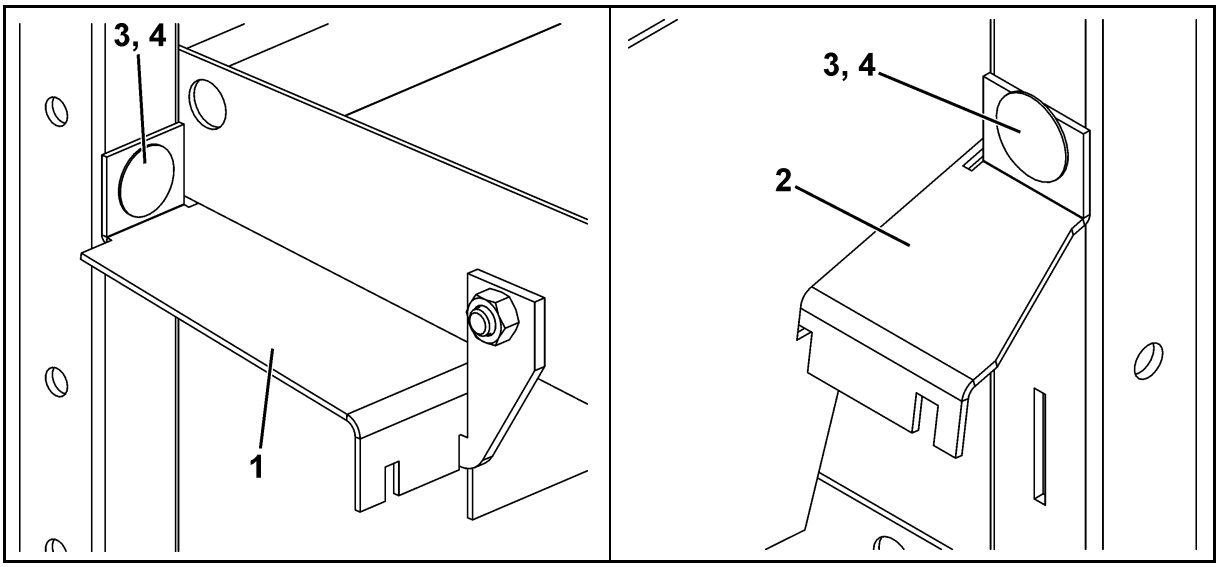
Important:

The "sheet metal perch 2412 112 mm NAT-60" (lower position 1 in the following picture) has to be **replaced** by a "sheet metal perch 1206 112mm NAT-60" drive collapsible grille automatic" and a "sheet metal perch 1206 112mm NAT-60" in the **lower area** in that section where a **drive for collapsible grille** has to be installed.

(For the assembly of the collapsible grille see chapter 16.5)



Pos.	Qty.	Code no.	Description
1	2	83-04-3282	sheet metal perch 2412 112mm NAT-60
2	4	83-04-3263	foot rail 1206 for feed trough pluggable NAT-60
3	12	99-10-3872	mushroom head screw M 6x16 slotted galv
4	12	99-10-1045	hexagon nut M 6 galv. DIN 934-8



position numbers: see previous page

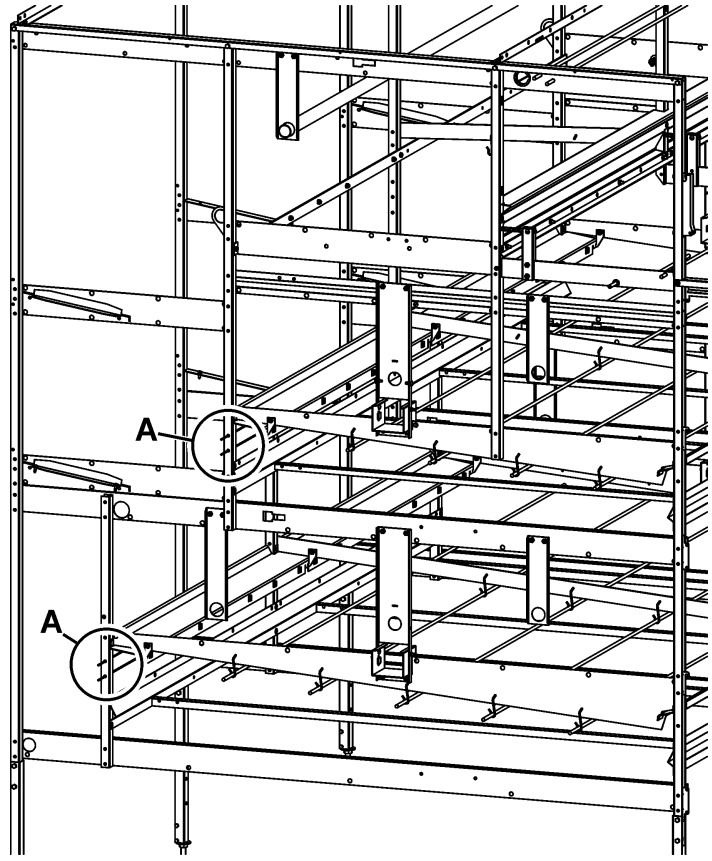
11.4 Insertion of the wire ropes beneath the sheet metal perches

Important:

Wire ropes are **not necessary**, if **air ducts** are to be installed.

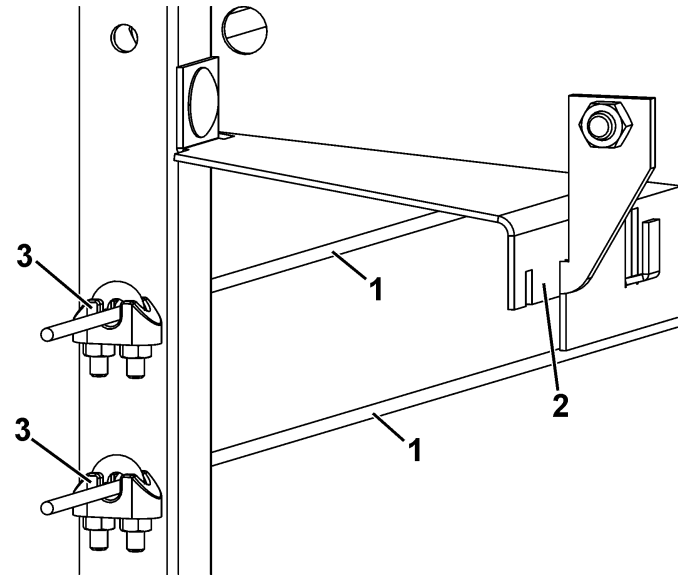
The air ducts are to be installed **before** the bottom wire grilles are inserted.

(For the assembly of the air ducts see chapter 12)



Beneath both sheet metal perches, two 3mm wire ropes each are pulled in through the repective holes in the posts.

A= positions of the wire ropes



The wire ropes are fastened to the end-set stands by means of one 3mm cable clamp each.

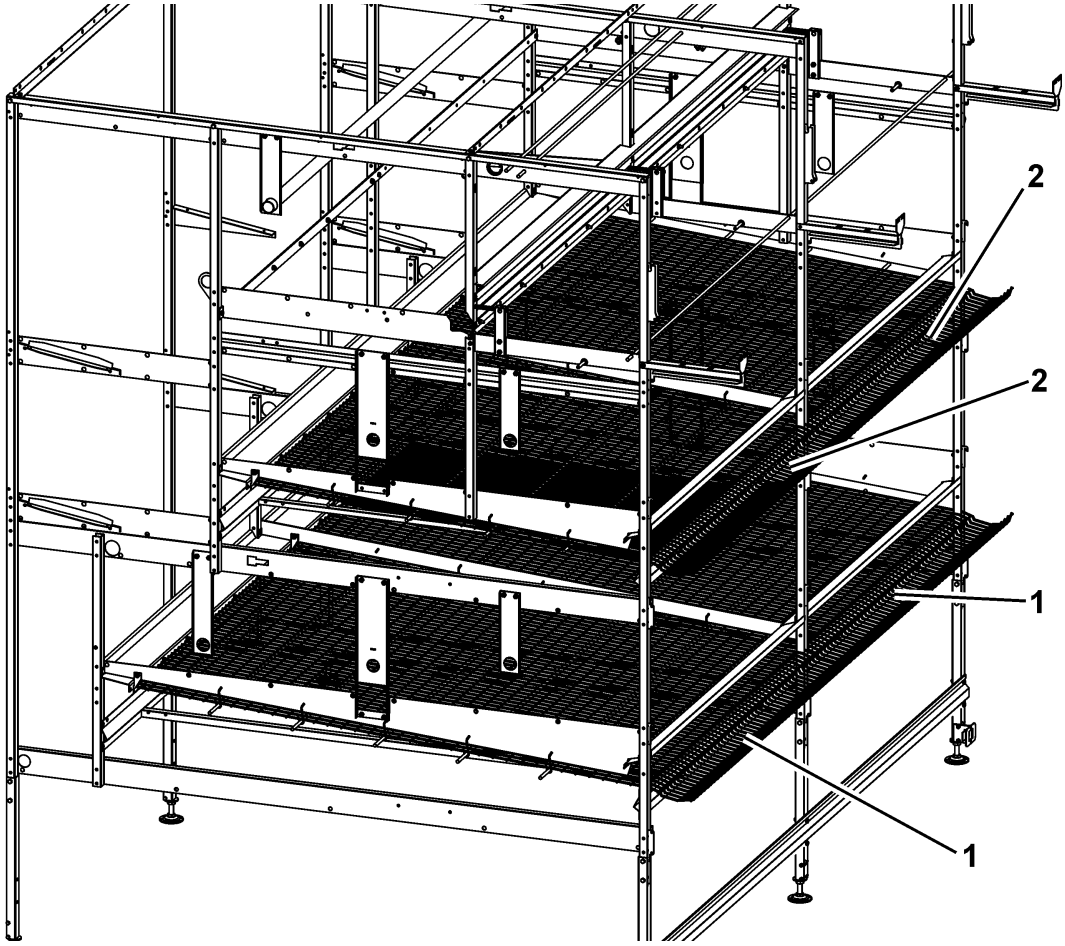
At the **other end** of each wire rope, a **tensioner** is installed, which is used to tension the wire rope.

Pos.	Qty.	Code no.	Description
1	2	83-04-3282	sheet metal perch 2412 112mm NAT-60
2		99-50-0013	wire rope 3 mm galv.
3	8	99-50-0014	cable clamp 3mm 1/8" galv DIN 741

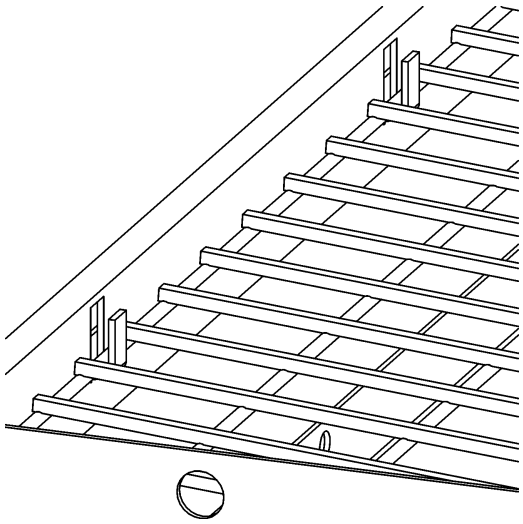
11.5 Placement of bottom wire grilles (centre and bottom tier)

Important:

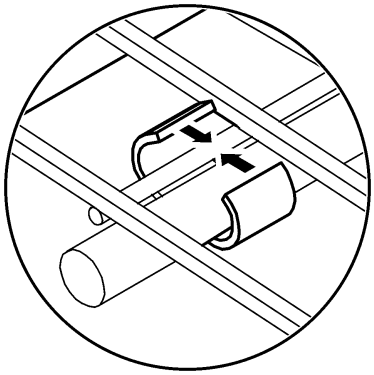
In order to guarantee a **tension-free placement** of the bottom wire grilles, each wire grille has to be **notched** in the area of the **stand post**.



Pos.	Qty.	Code no.	Description
1	2	83-03-9522	bottom wire grille 1206 MB-level NAT-60-1800 BD-C2+ (ZnAl)
2	2	83-03-9520	bottom wire grille 1206 MB-level 1200 NAT-60-1800 BD-C2+ (ZnAl)
3	4	38-90-3714	clip 10x1.2 SST



Every bottom wire grille is hooked into the hooks of the sheet metal perches and is then fastened with **3 clips per rod.**

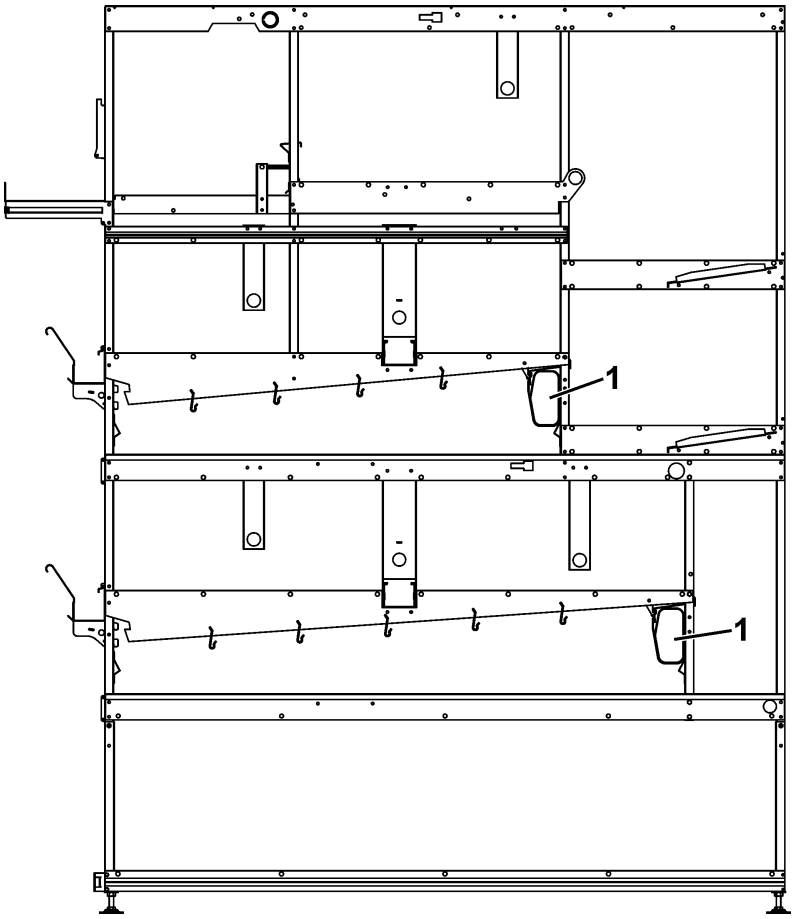


12 Assembly of the air ducts (option)

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

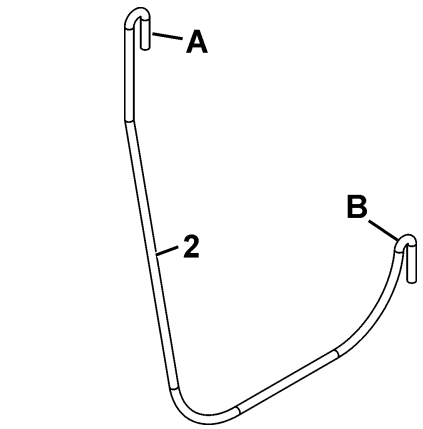
Important:

When assembling the air ducts please see to it that the holes in the air duct point into the direction of the manure belt.



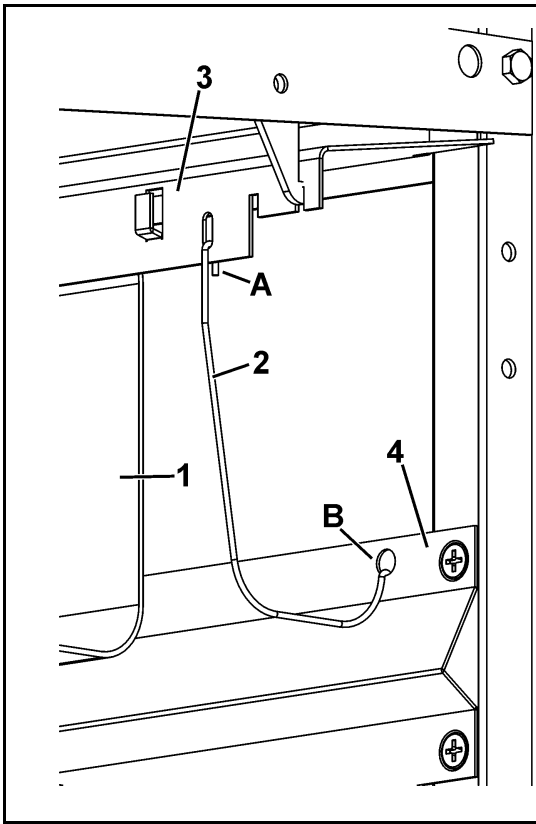
Pos.	Qty.	Code no.	Description
1		83-04-3322	airduct 150x80-4820/20x6mm NAT-60

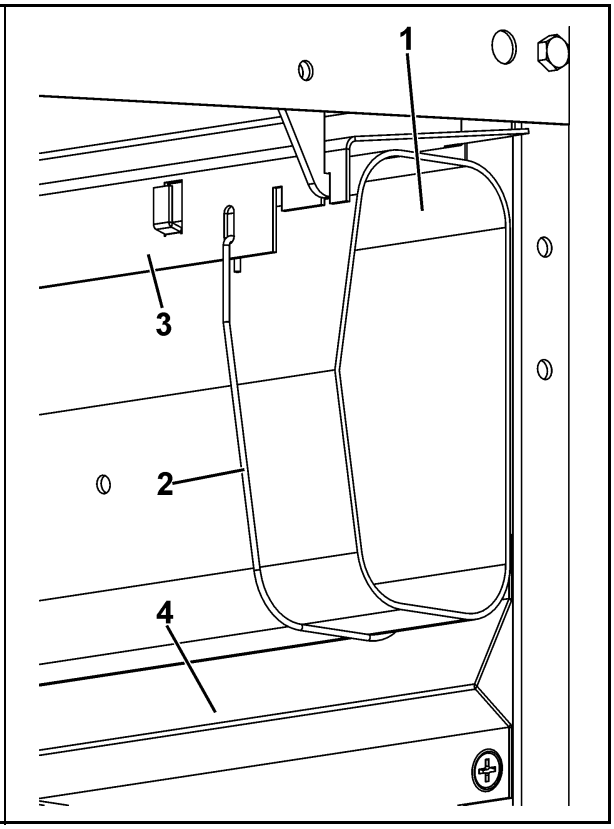
The airducts will be fixed by hooking in the hangers to the sheet metal perches and side rails **every 2,4 m** directly besides the stand.



A= End hooked into the sheet metal perch

B= End hooked into the side rail



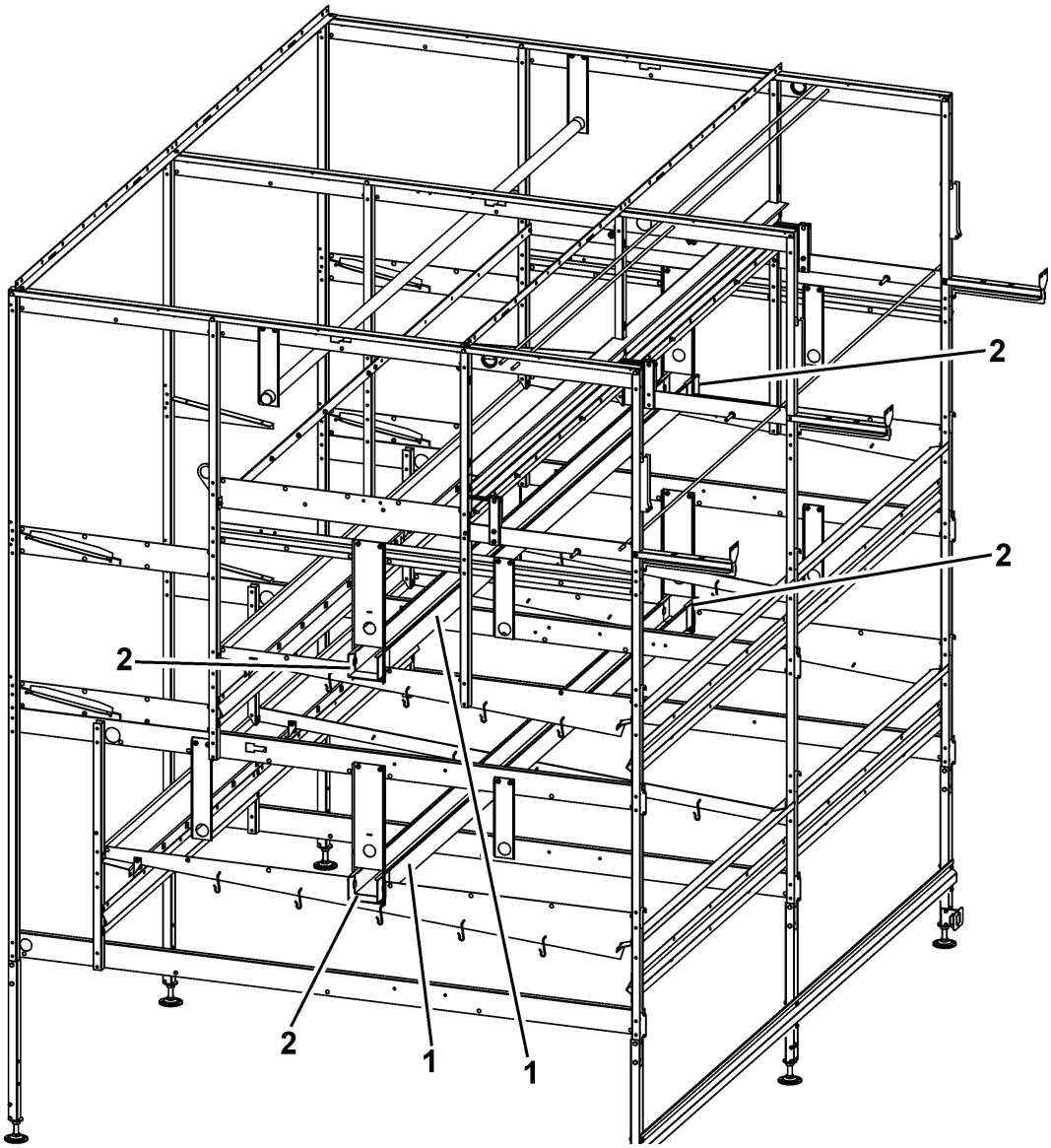


Pos.	Qty.	Code no.	Description
1		83-04-3322	airduct150x80-4820/20x6mm NAT-60
2		81-21-6343	hanger for airduct DN120
3		83-04-3282	sheet metal perch 2412 112mm wide NAT-60
4		83-03-9725	side rail 2412 KB NAT-60

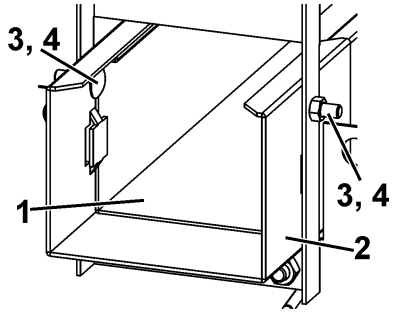
13 Assembly of feed troughs and tubes (perches)

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

13.1 Position of the feed troughs in the section



Pos.	Qty.	Code no.	Description
1	2	83-00-2831	feed trough regular 2407 NAT-Nova
2	4	83-03-2921	coupler for feed trough NAT-AZ/L
3		99-10-1047	mushroom head screw M 5x10 galv. slotted
4		99-10-1023	hexagon nut M 5 galv. DIN 934-8

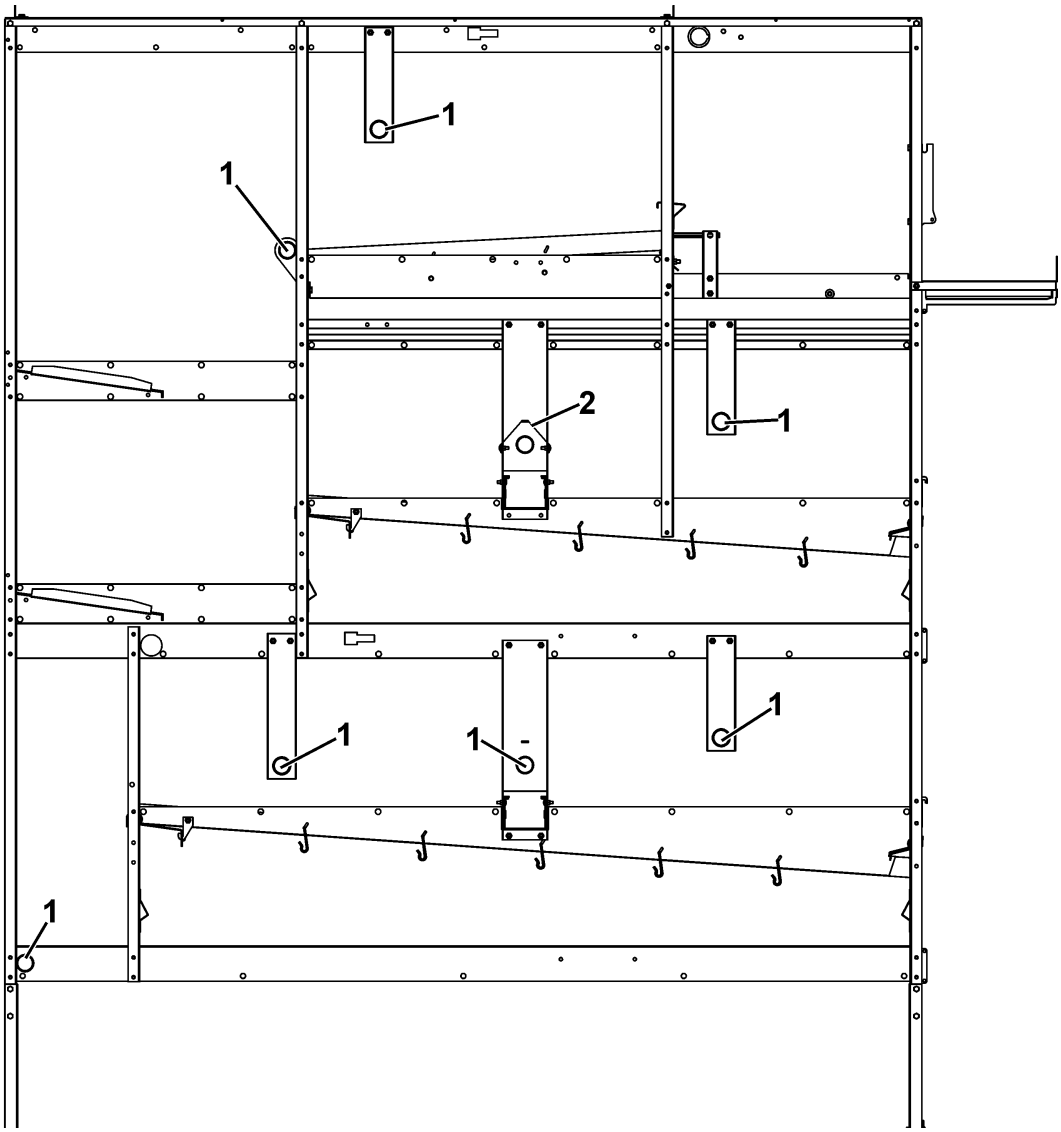


At the **beginning and end** of a row the feed troughs are fastened to the coupling and the suspension by means of hexagon head screws M5x10 and nuts.

Within the row, the couplings with the feed troughs are inserted in the suspensions **without screwing.**

13.2 Assembly of the tubes (perches) and the cover V-profile

Assembly of the tubes (perches) and the cover V-profile:



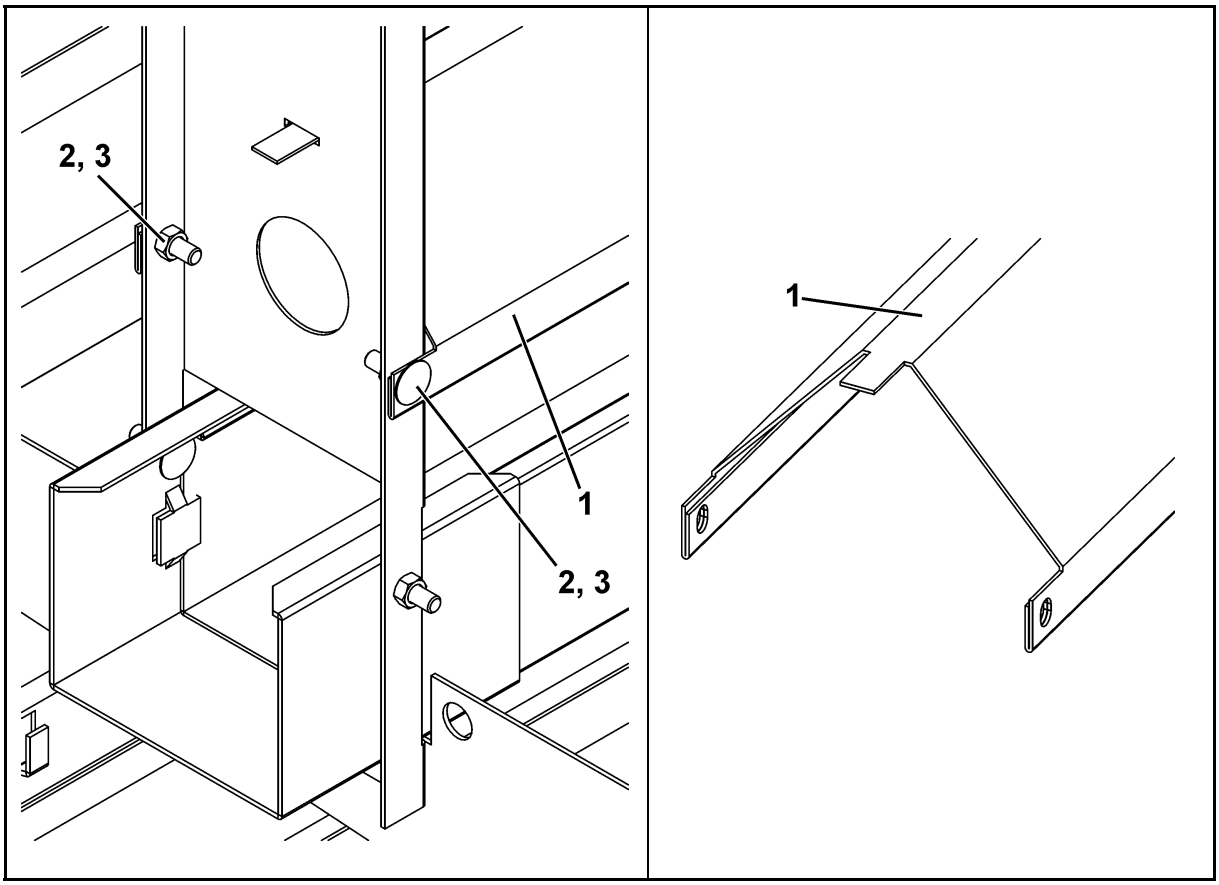
Pos.	Qty.	Code no.	Description
1		83-02-2549	tube 33.5x1.50-5800 reduced (coupled 5750)
2		83-03-9922	cover 2412 V-profile above feed trough regular NAT-60

Reg. the connection of the tubes: see chapter 9.3.2 .

Important:

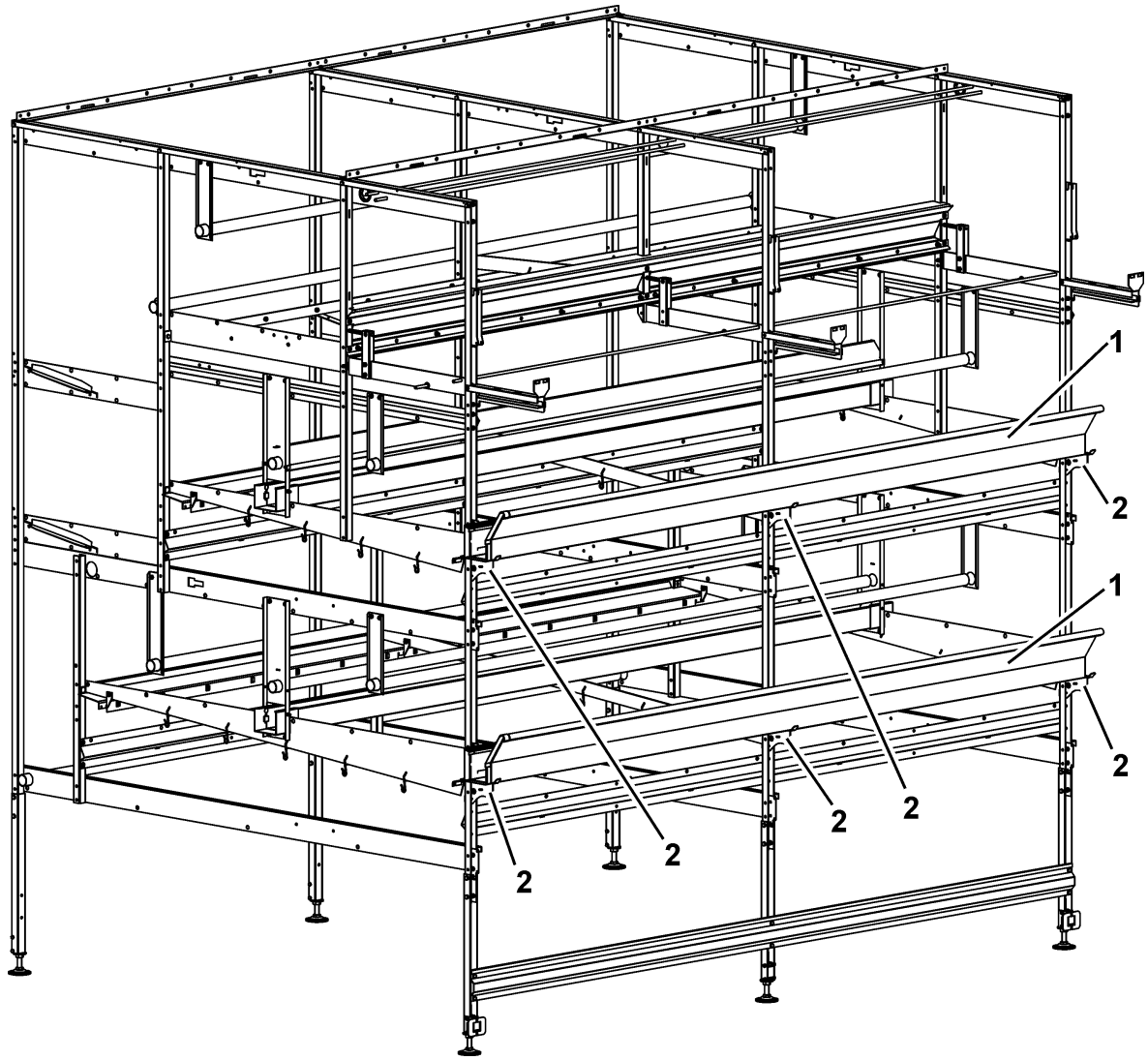
The "cover V-profile for regular trough" needs only be installed in the **centre tier.**

Two consecutive profiles are screwed together to one suspension.

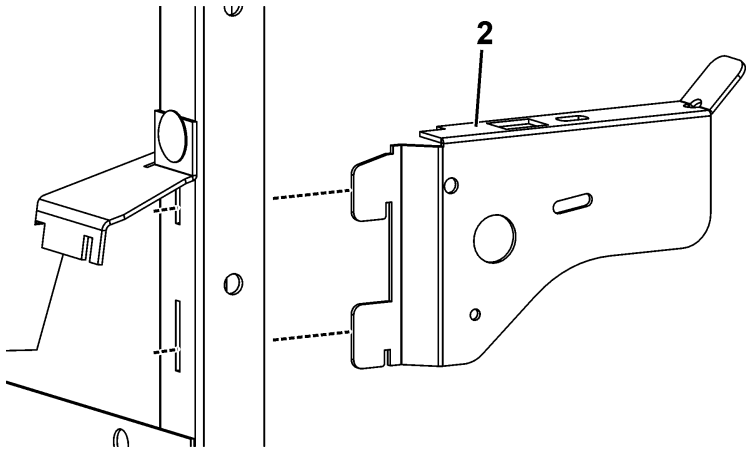


Pos.	Qty.	Code no.	Description
1	1	83-03-9922	cover 2412 V-profile above feed trough regular NAT-60
2	4	99-10-1047	mushroom head screw M 5x10 galv. slotted
3	4	99-10-1023	hexagon nut M 5 galv. DIN 934-8

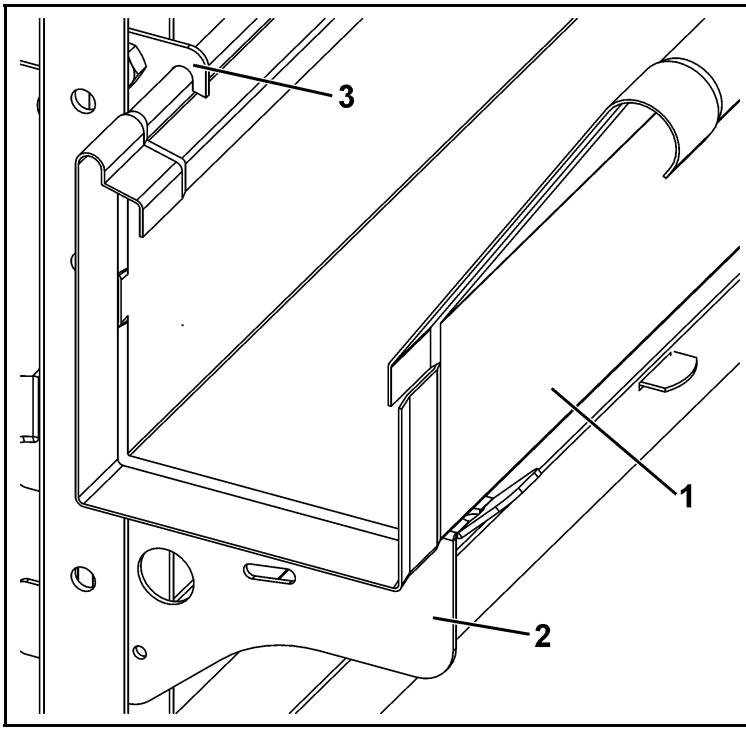
13.3 Installing the outer feed troughs



Pos.	Qty.	Code no.	Description
1	2	83-00-4344	feedtrough 2412 pluggable ccw EV/UV
2	6	83-03-2009	bracket 1.50mm for freed trough pluggable EV-EU/UV



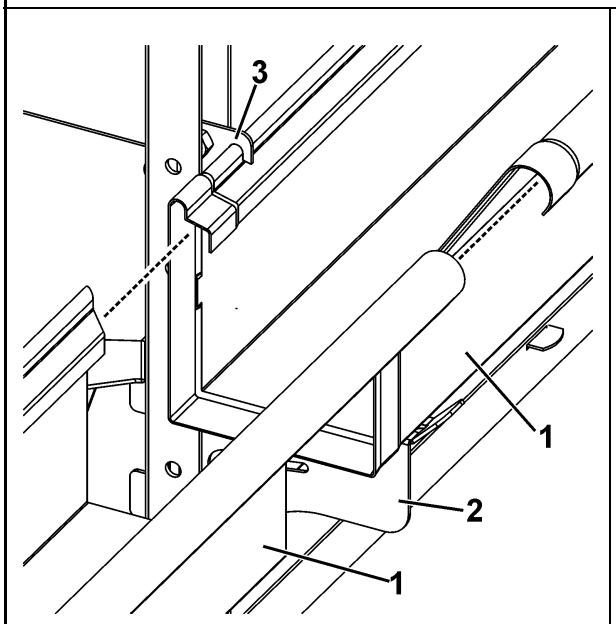
The brackets have to be hooked into the respective openings of the posts.

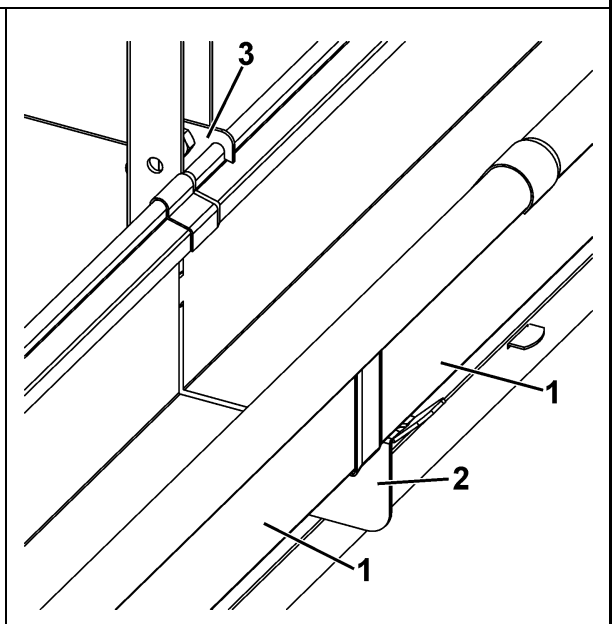


The feed troughs are hooked into the fastening brakets at the cage stands and then laid onto the trough supports.

Two consecutive feed troughs are plugged together.

Plug the outer feed troughs together

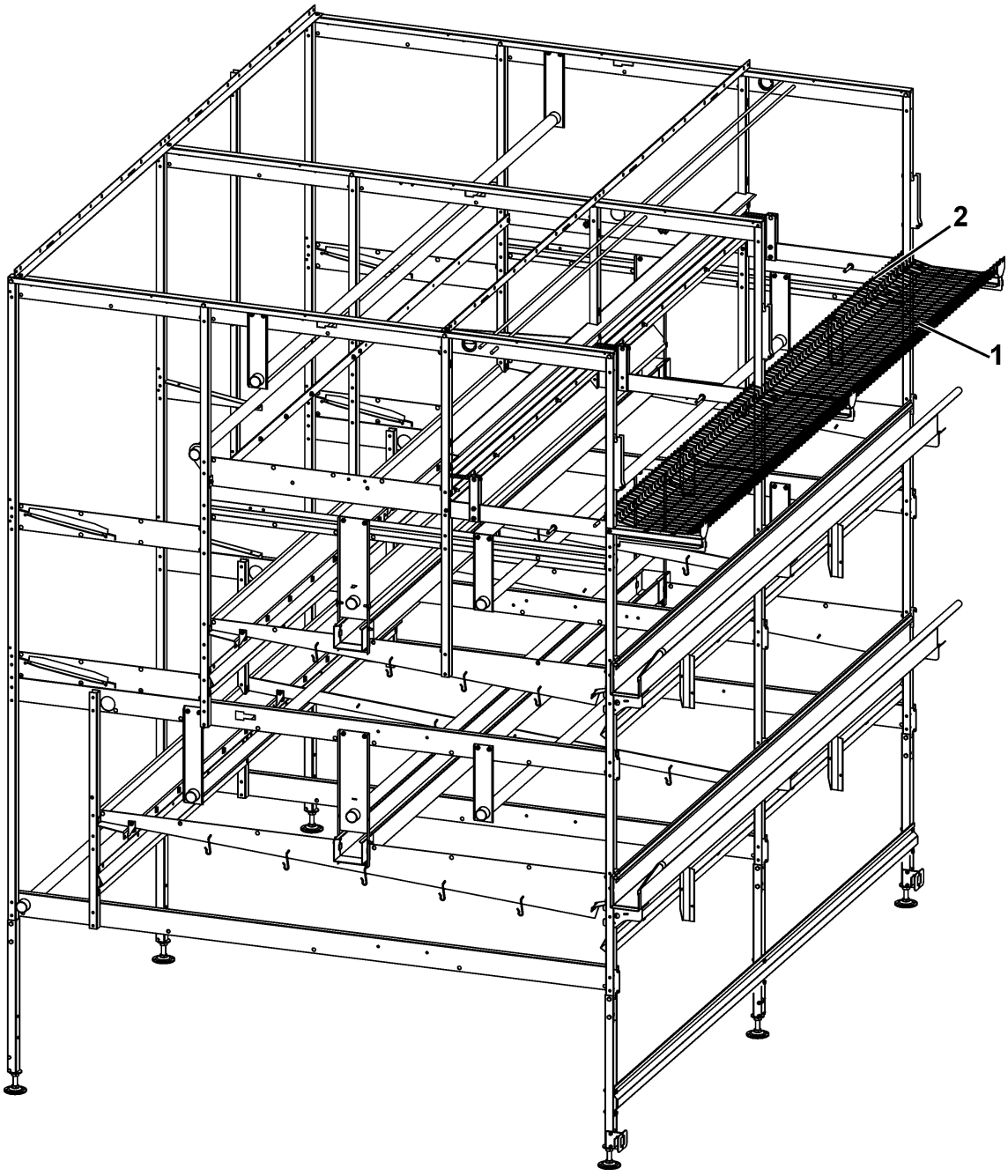




Pos.	Qty.	Code no.	Description
1	2	83-00-4344	feedtrough 2412 pluggable ccw EV/UV
2	6	83-03-2009	bracket 1.50mm for freed trough pluggable EV-EU/UV
2	6	83-03-9808	fastening hook for feed trough pluggable NAT-60

14 Installing the egg channel

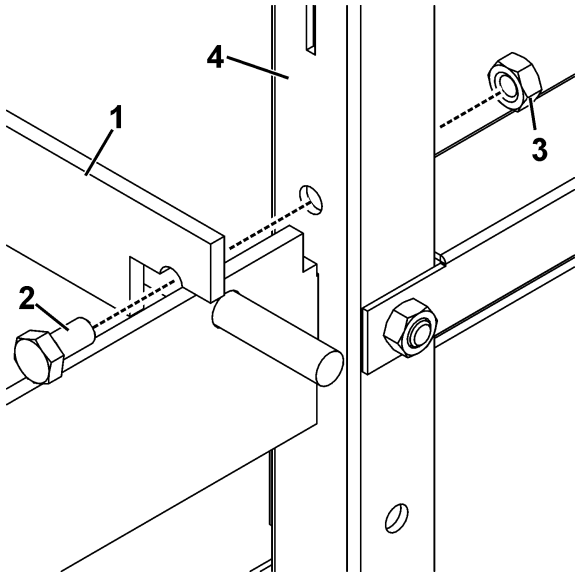
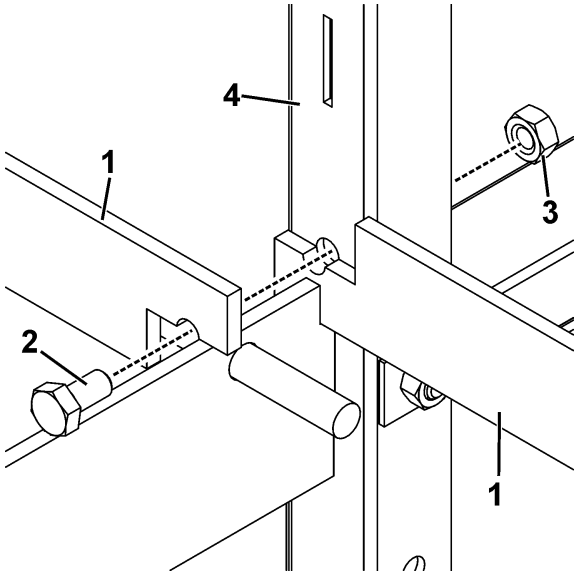
For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.



Pos.	Qty.	Code no.	Description
1	1	83-03-9528	wire grille 2412 for egg channel LB 245 NAT-60 BD-C2+ (ZnAl)
2	1	83-03-9732	support 2412 wire grille for egg channel LB245 NAT-60 BD-C2+

14.1 Assembly of the support 2412 for wire grille for egg channel

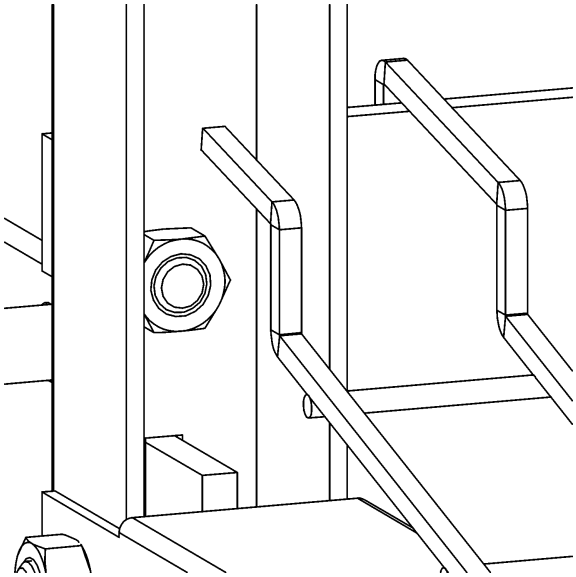
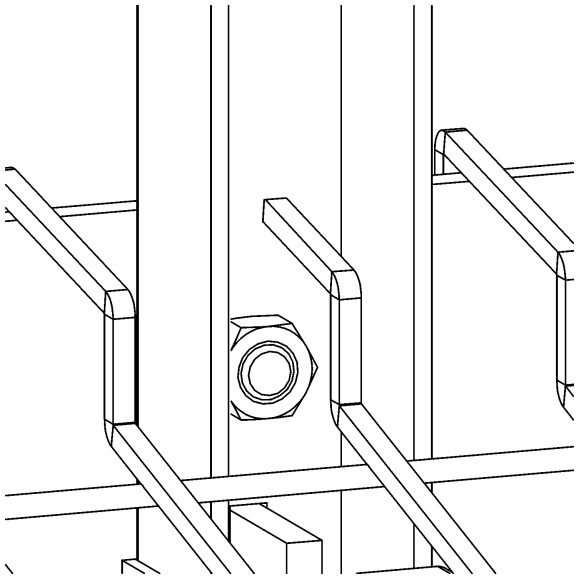
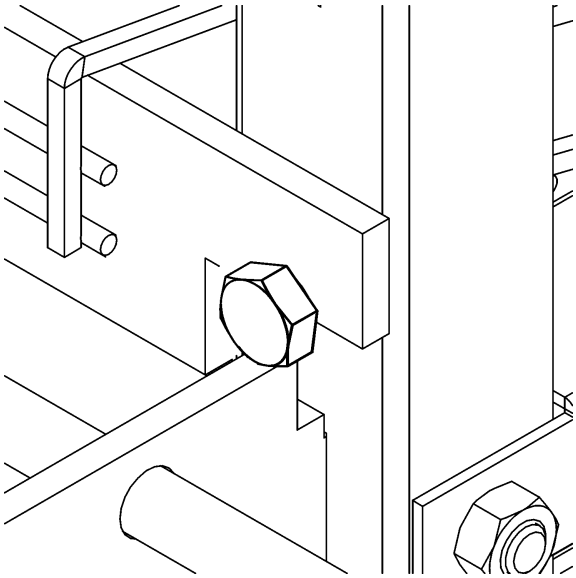
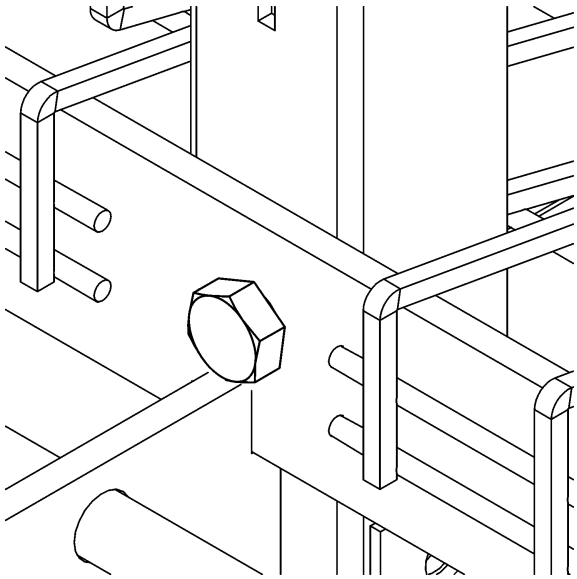
	The "support 2412 wire grille for egg channel LB245 NAT-60" has to be screwed to the post every 1206 mm by means of hexagon head screws M6x12 and nuts.

Screw the supports at the beginning / end of a row	**Screw the supports within the row together**
	

Pos.	Qty.	Code no.	Description
1	1	83-03-9732	support 2412 wire grille for egg channel LB245 NAT-60 BD-C2+
2	3	99-10-1110	hexagon head screw M 6x12 galv.
3	3	99-10-1045	hexagon nut M 6 galv. DIN 934-8
4	3	83-04-3262	post feeding side NAT-60

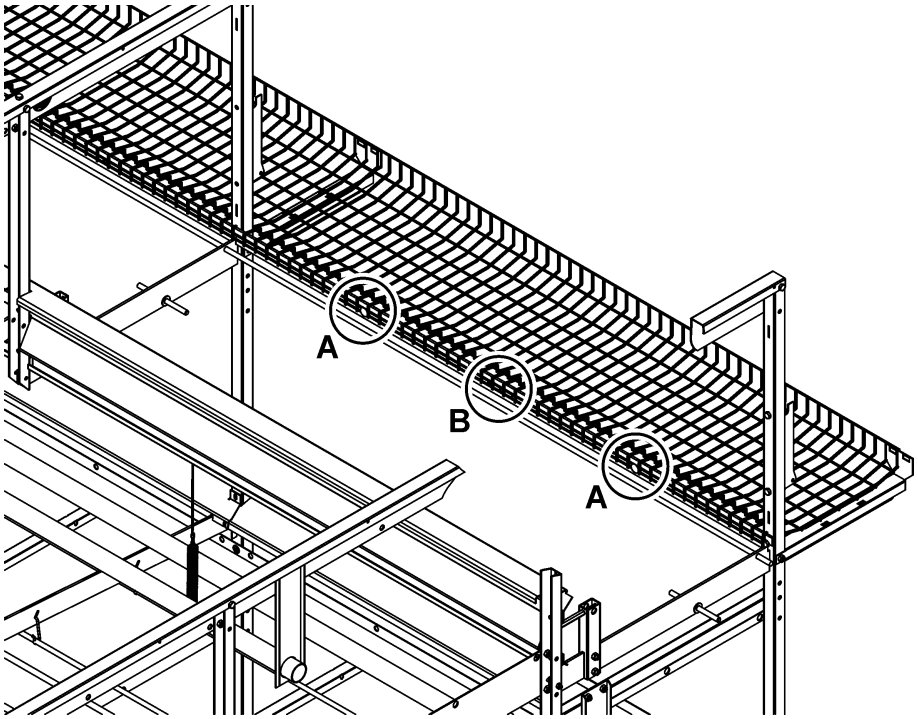
14.2 Laying out the wire grille for the egg channel

	The "wire grille egg channel LB245" has to be unlatched in the area of the posts.

Notch beginning / end of a row	Notch within a row
	
	

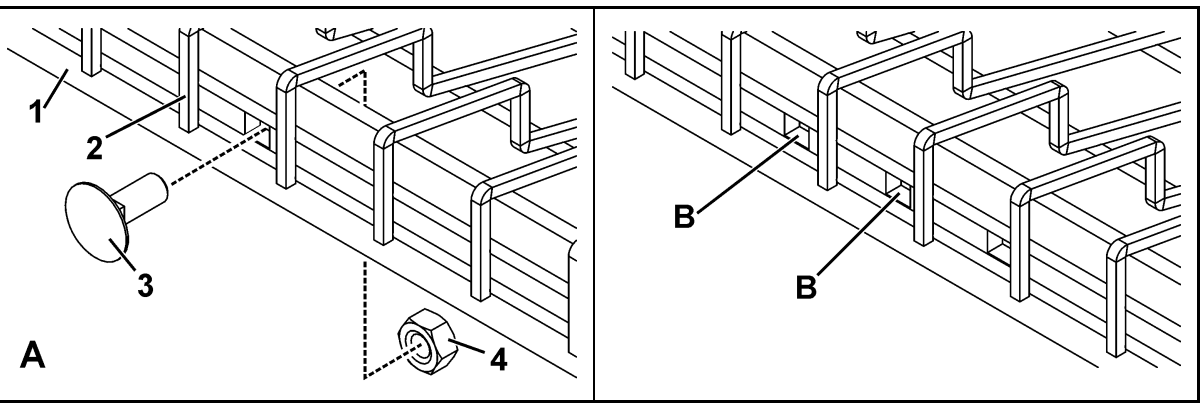
14.3 Screwing the wire grille to the support

The **wire grille is screwed to the support** by means of 4 mushroom head square neck bolts M6x16 for each section half. **Two of the screws** may be attached immediately. The **other two screws** have to be screwed down later. (see chapter 16.4.1, Seite 123).



A= positions at which the screws can be screwed down immediately

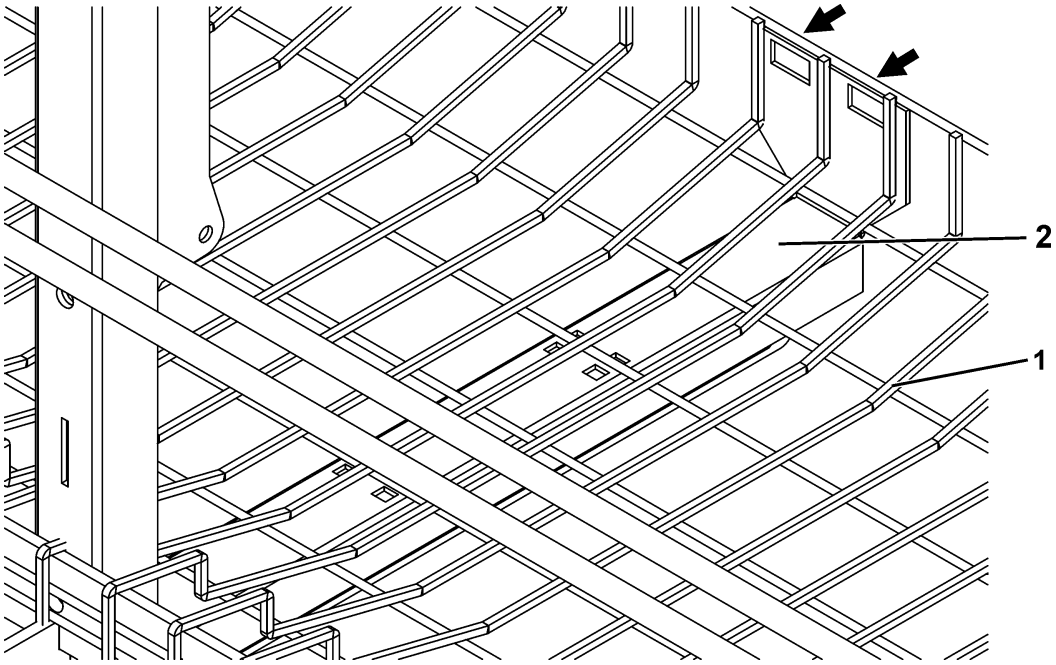
B= positions to which later on the "T-bracket for fasterner" has to be screwed.



Pos.	Qty.	Code no.	Description
1	1	83-03-9732	support 2412 wire grille for egg channel LB245 NAT-60 BD-C2+
2	1	83-03-9528	wire grille 2412 for egg channel LB 245 NAT-60 BD-C2+ (ZnAl)
3	4	99-10-1602	mushroom head square neck bolt M6x16 DIN 603 galv
4	4	99-10-1045	hexagon nut M 6 galv. DIN 934-8

14.4 Attachment of the wire grille at the support for egg channel

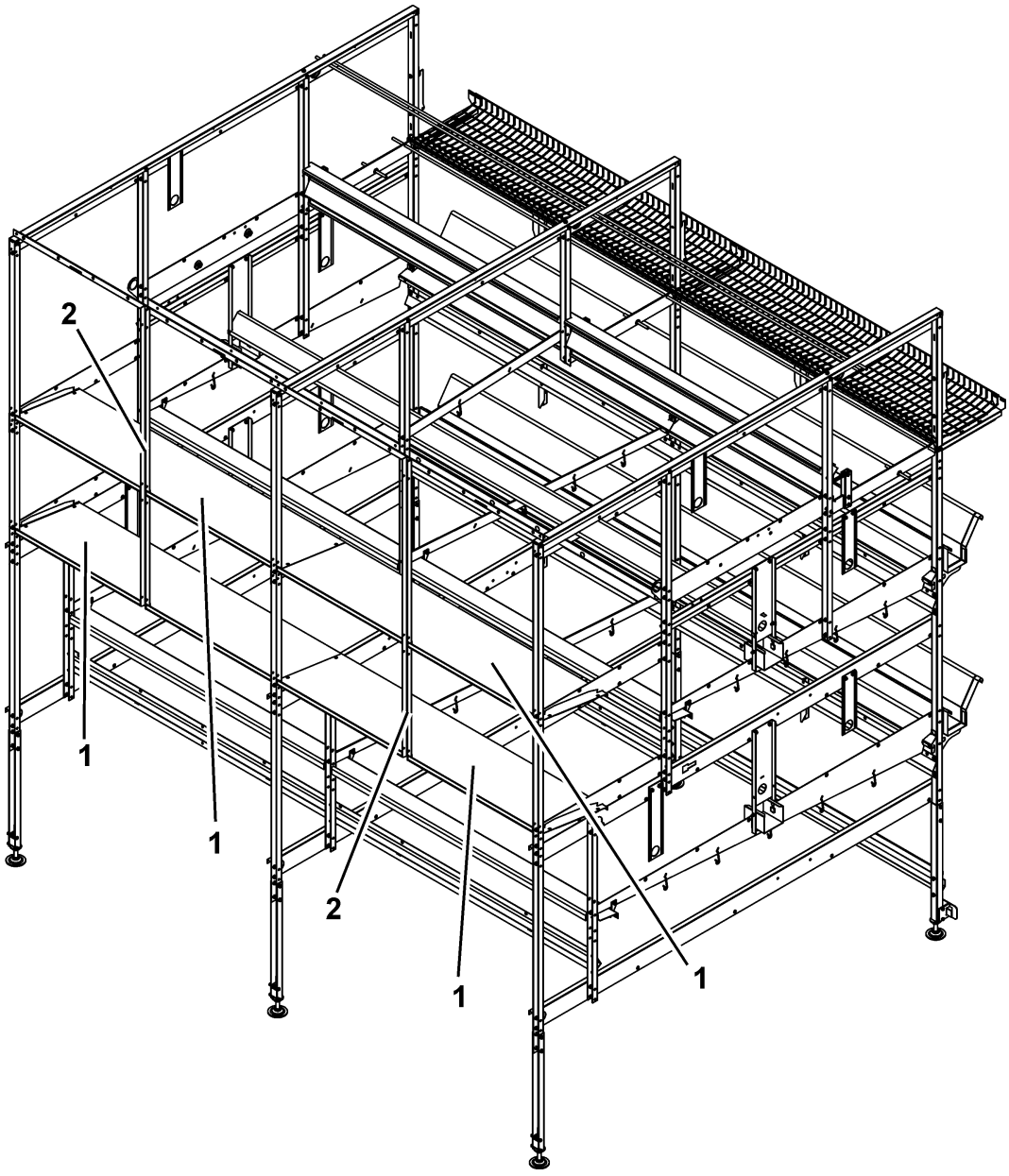
The wire grille has to be attached to the support for the egg channel by means of clips 10x1.2 (see arrows: 2 pc. per support)



Pos.	Qty.	Code no.	Description
1	1	83-03-9528	wire grille 2412 for egg channel LB 245 NAT-60 BD-C2+ (ZnAl)
2	1	83-03-9693	support for egg channel LB245 nest NAT-60 BD-C2+
3	3	38-90-3714	clip 10x1.2 SST

15 Assembly of the stainless steel covers and posts 603

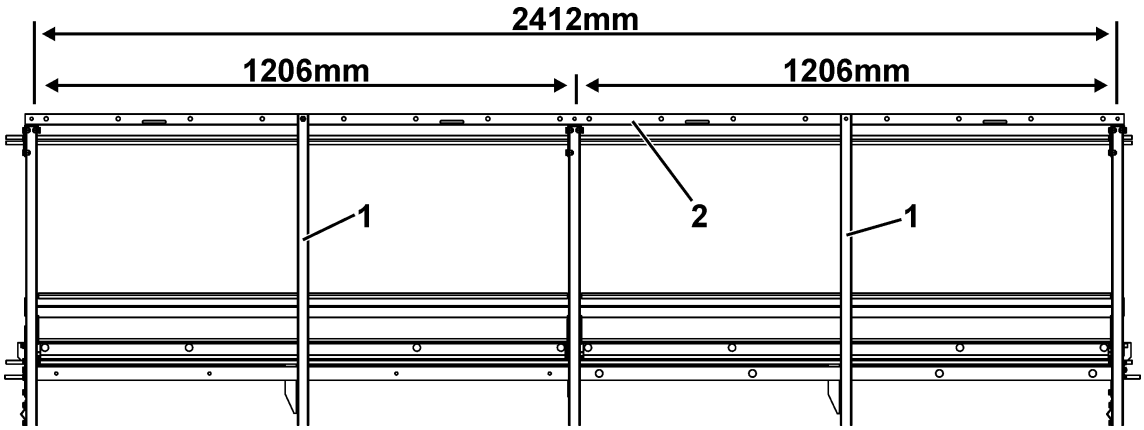
For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.



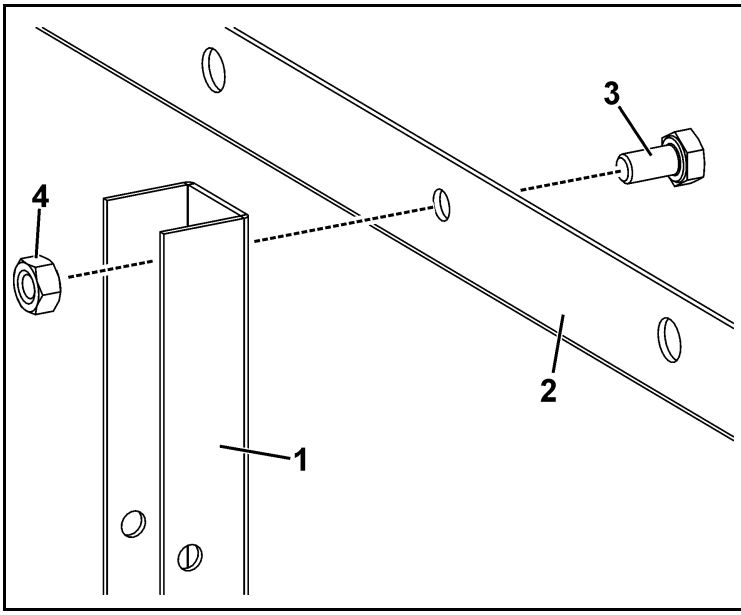
Pos.	Qty.	Code no.	Description
1	4	83-03-9739	cover 1206 SST NAT-60 BD-C2+
2	2	83-03-9755	post 603 for sliding front staircase NAT-60

15.1 Assembly of the posts 603 for sliding front

	Every post 603 has to be screwed centrally to the top wire mesh rail in the section half.



Pos.	Qty.	Code no.	Description
1	2	83-03-9755	post 603 for sliding front staircase NAT-60
2	2	83-03-9740	angle 2412 for top wire mesh NAT-60
3	12	99-20-1470	hexagon head screw SST M 6x 12 DIN 933
4	1	99-20-1102	hexagon nut M 6 SST DIN 934



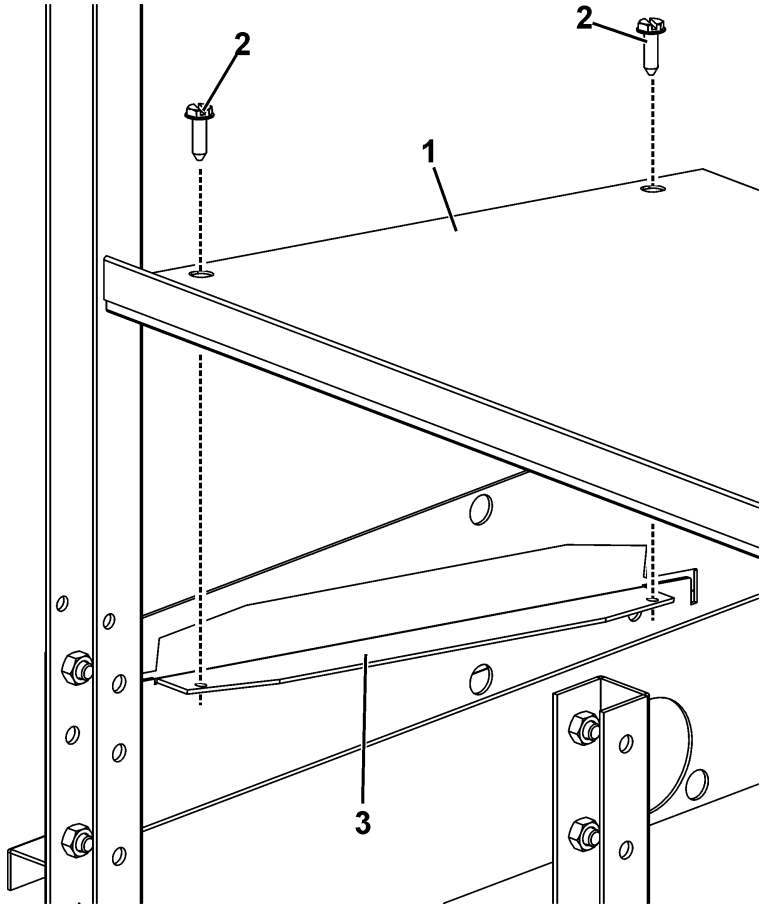
The posts 603 are screwed to the top wire rail from the inside to the outside.

This way, the following assembly of the top wire is not obstructed.

15.2 Assembly of the stainless steel covers

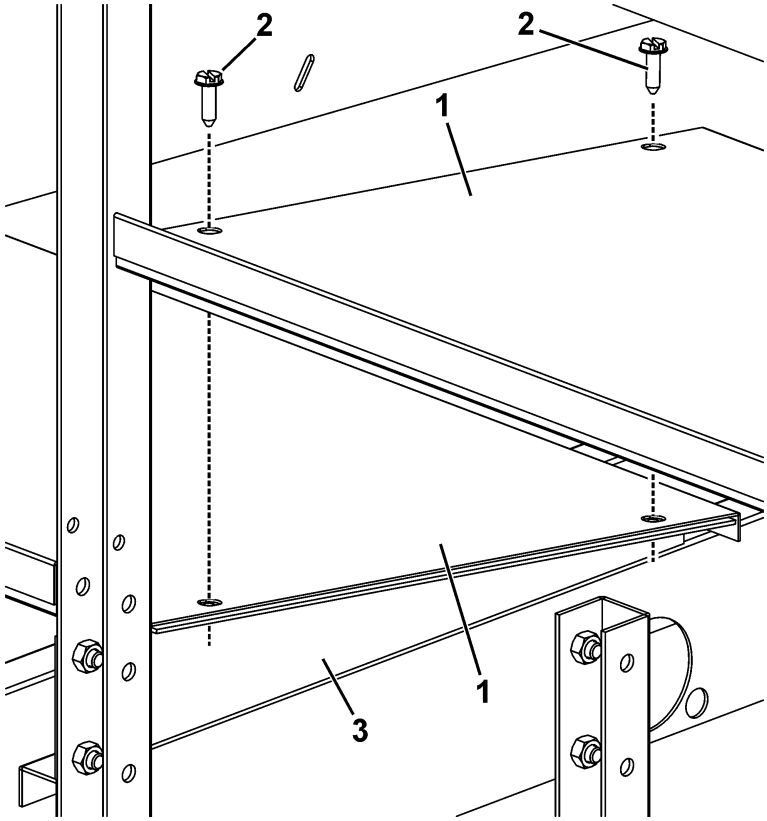
	Start at that side of the installation at which you can lay down the cover on the "sheet metal for cover SST" (at cage stand 2412) and the "supporting elbow for SST cover Nat 60" (at cage stand 1206). Two consecutive covers have to be fastened together by means fo two **SST drilling screws.**

Screwing at the beginning of a row (cage stand 2412)



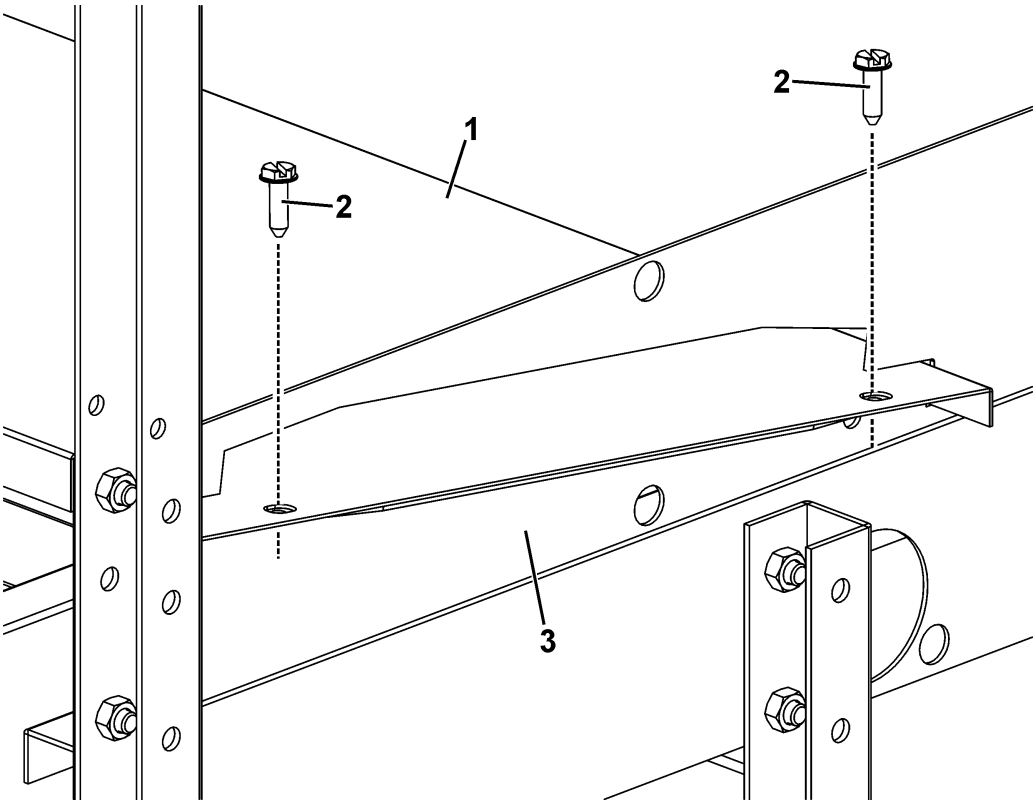
Pos.	Qty.	Code no.	Description
1	2	83-03-9739	cover 1206 SST NAT-60 BD-C2+
2	4	81-04-3404	drilling screw 4,8x16 DIN 7504-L SST
3	2	83-03-9688	sheet metal galv. for cover SST NAT-60

Screwing together two covers in the middle of a section (cage stand 1206)



Pos.	Qty.	Code no.	Description
1	4	83-03-9739	cover 1206 SST NAT-60 BD-C2+
2	4	81-04-3404	drilling screw 4,8x16 DIN 7504-L SST
3	2	83-03-9718	supporting elbow galv. for cover SST NAT-60

Screwing at the end of a row (cage stand 2412)

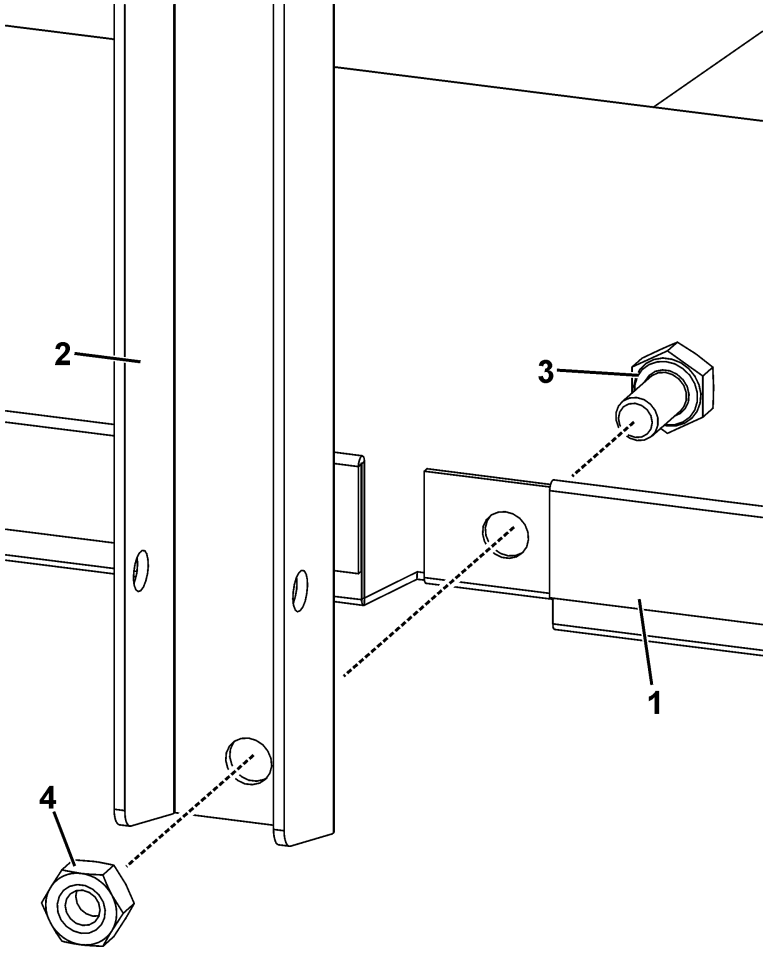


The covers have to be inserted through the respective openings in the sheet metal partitions and then fastened by means of two **SST drilling screws.**

Pos.	Qty.	Code no.	Description
1	2	83-03-9739	cover 1206 SST NAT-60 BD-C2+
2	4	81-04-3404	drilling screw 4,8x16 DIN 7504-L SST
3	2	83-03-9688	sheet metal galv. for cover SST NAT-60

15.2.1 Fixation of the covers at the post 603

	Each of the 4 stainless steel cover per section is fixed to the post 603 in the centre by means of an offset screw shackle. This assembly step requires **stainless steel hexagon head screws.**.

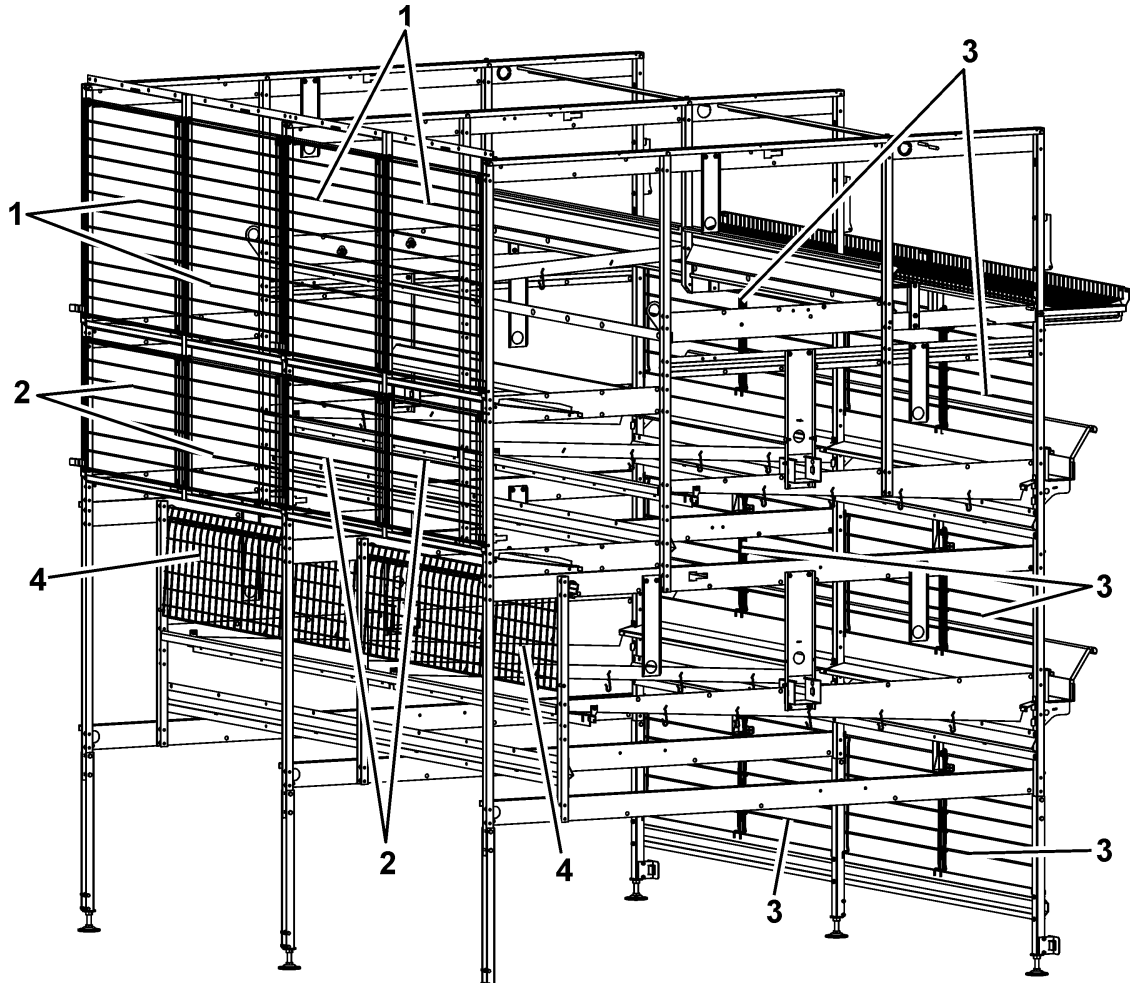


Pos.	Qty.	Code no.	Description
1	4	83-03-9739	cover 1206 SST NAT-60 BD-C2+
2	2	83-03-9755	post 603 for sliding front staircase NAT-60
3	4	99-20-1470	hexagon head screw SST M 6x 12 DIN 933
4	4	99-20-1102	hexagon nut M 6 SST DIN 934

16 Assembly of sliding fronts and collapsible grilles

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

16.1 Positon of the grilles in a section

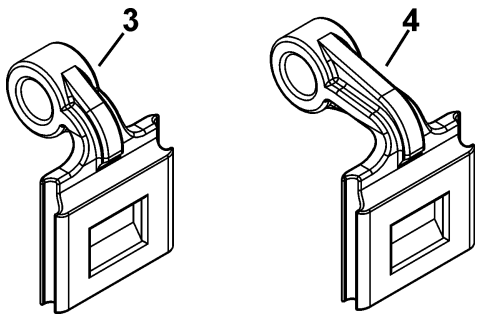


Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	6	83-01-2778	cage front EV625-EU 0103 (ZnAl)
4	2	83-03-9662	collapsible grille 1206 scratching area NAT-60 BD-C2+ (ZnAl)

In the following, positions 1 and 2 are referred to as **"sliding front staircase"** and position 3 is referred to as **"sliding front below nest".**

16.2 Overview of sliding fronts and collapsible grilles

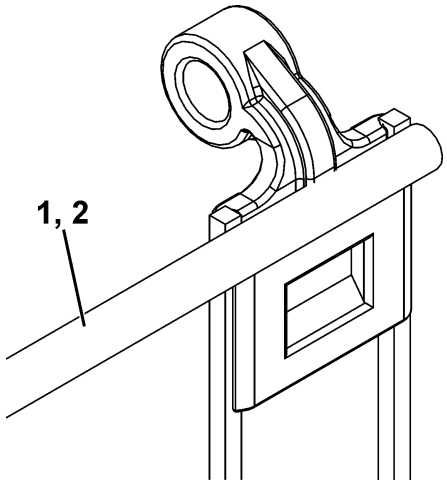
Definition of (bs) and (bl)

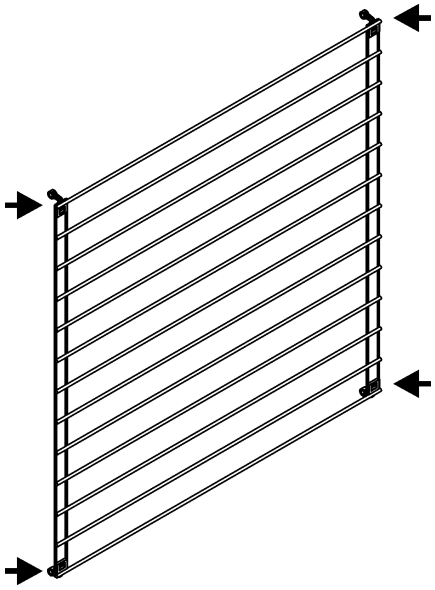


2 sliding fronts with 4x Pos. 3 and 2 sliding fronts with 4x Pos. 4 are premounted per section 2412 and level (upper/middle).

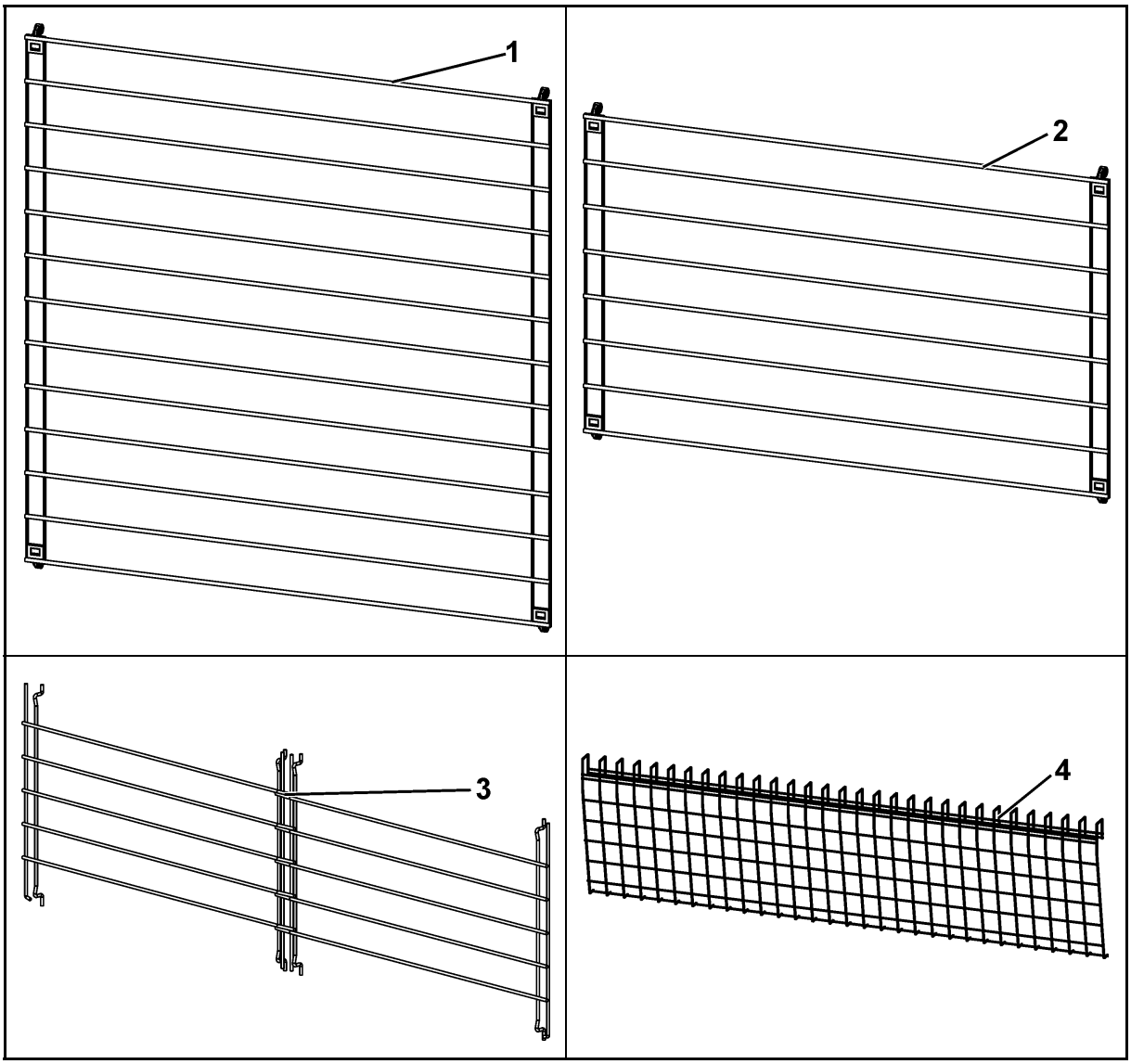
(bs)= **short** bracket POM (Pos 3)

(bl)= **long** bracket POM (Pos 4)





Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	16	83-00-2768	bracket POM for sliding front 603 UV-S (bs)
4	16	83-00-2769	bracket POM for sliding front 603 UV-S (bl)



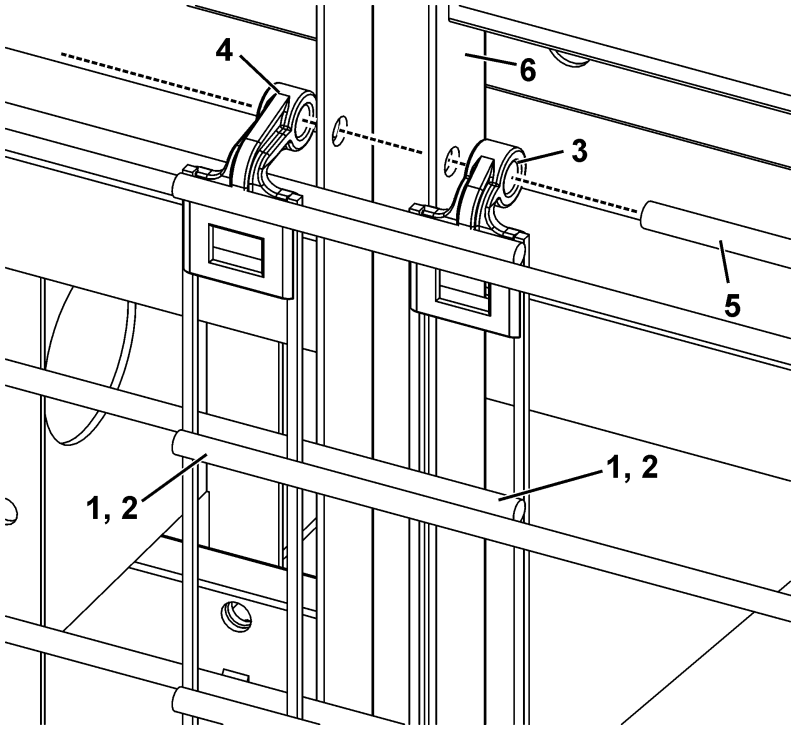
Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	6	83-01-2778	cage front EV625-EU 0103 (ZnAl)
4	2	83-03-9662	collapsible grille 1206 scratching area NAT-60 BD-C2+ (ZnAl)

16.3 Assembly sliding front staircase (top and bottom)

16.3.1 Insertion of the sliding fronts and of the upper rods

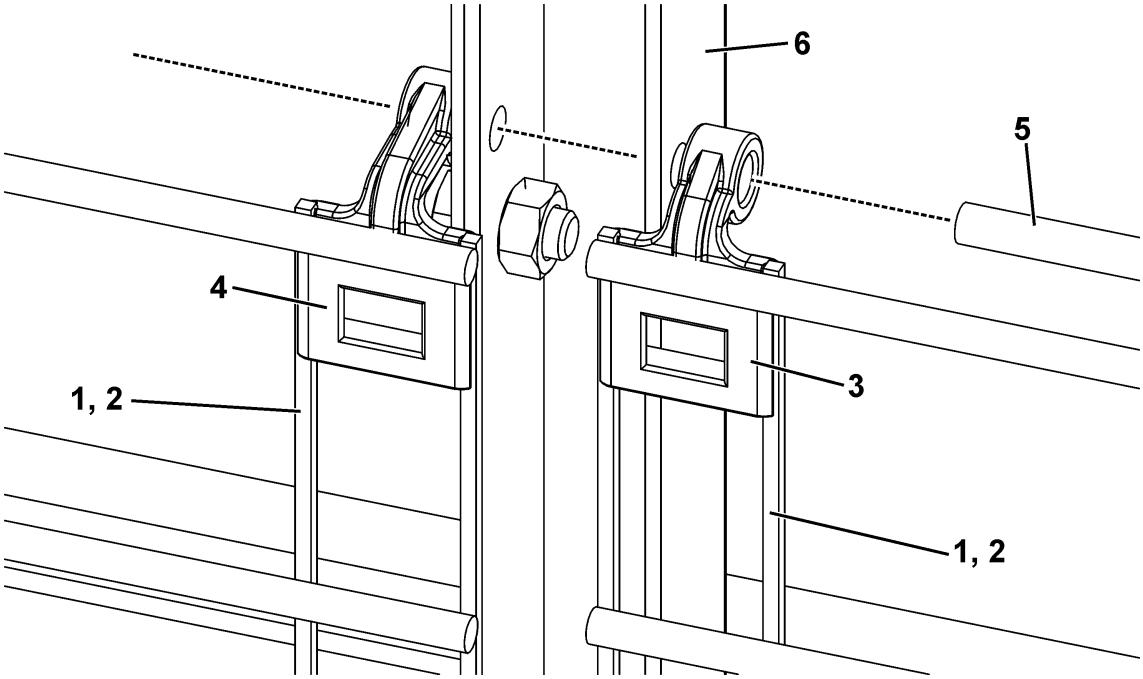
	The first rod of a row will be inserted over the whole length. Any further rod will reach up to the next four posts. The ends of the rods will be fixed with a "fastener round 5mm" **in the post**.

Sliding fronts at post 603



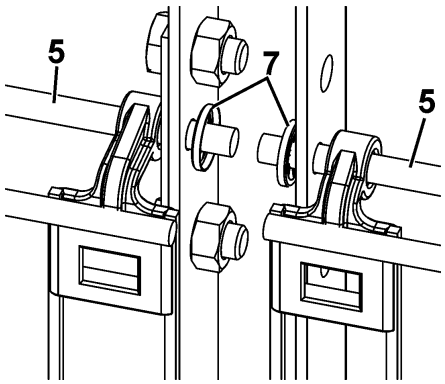
Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	16	83-00-2768	bracket POM for sliding front 603 UV-S (bs)
4	16	83-00-2769	bracket POM for sliding front 603 UV-S (bl)
5		83-00-2932	rod 5x4820 galv.
6	2	83-03-9755	post 603 for sliding front staircase NAT-60

Sliding fronts at the cage stands



Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	16	83-00-2768	bracket POM for sliding front 603 UV-S (bs)
4	16	83-00-2769	bracket POM for sliding front 603 UV-S (bl)
5		83-00-2932	rod 5x4820 galv.
6	3	83-03-9708	post staircase NAT-60
7		99-50-1273	fastener round 5mm

Fixing of the ends of the rods

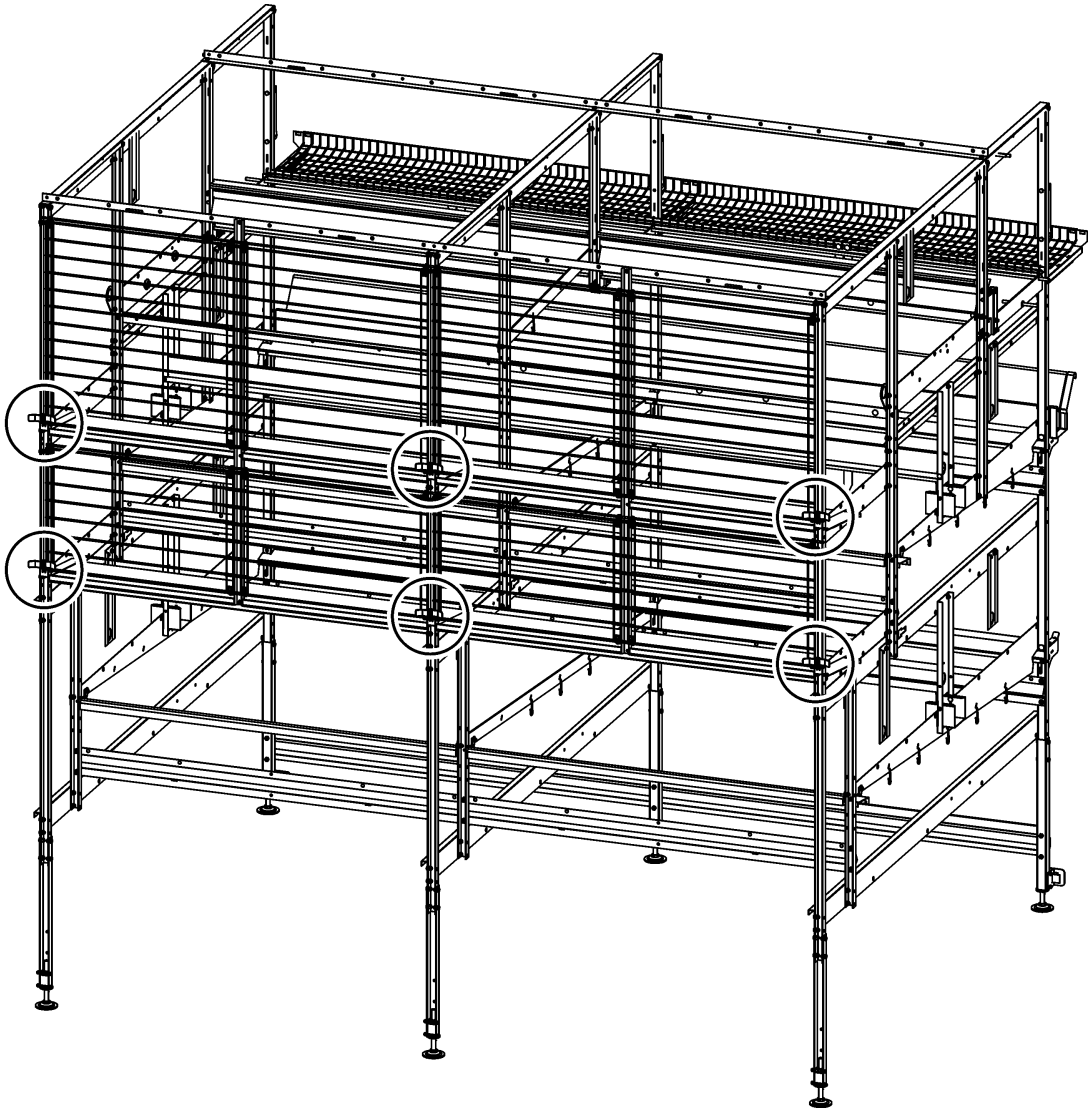


The ends of the rods will be fixed with a "fastener round 5mm" **in the post**.

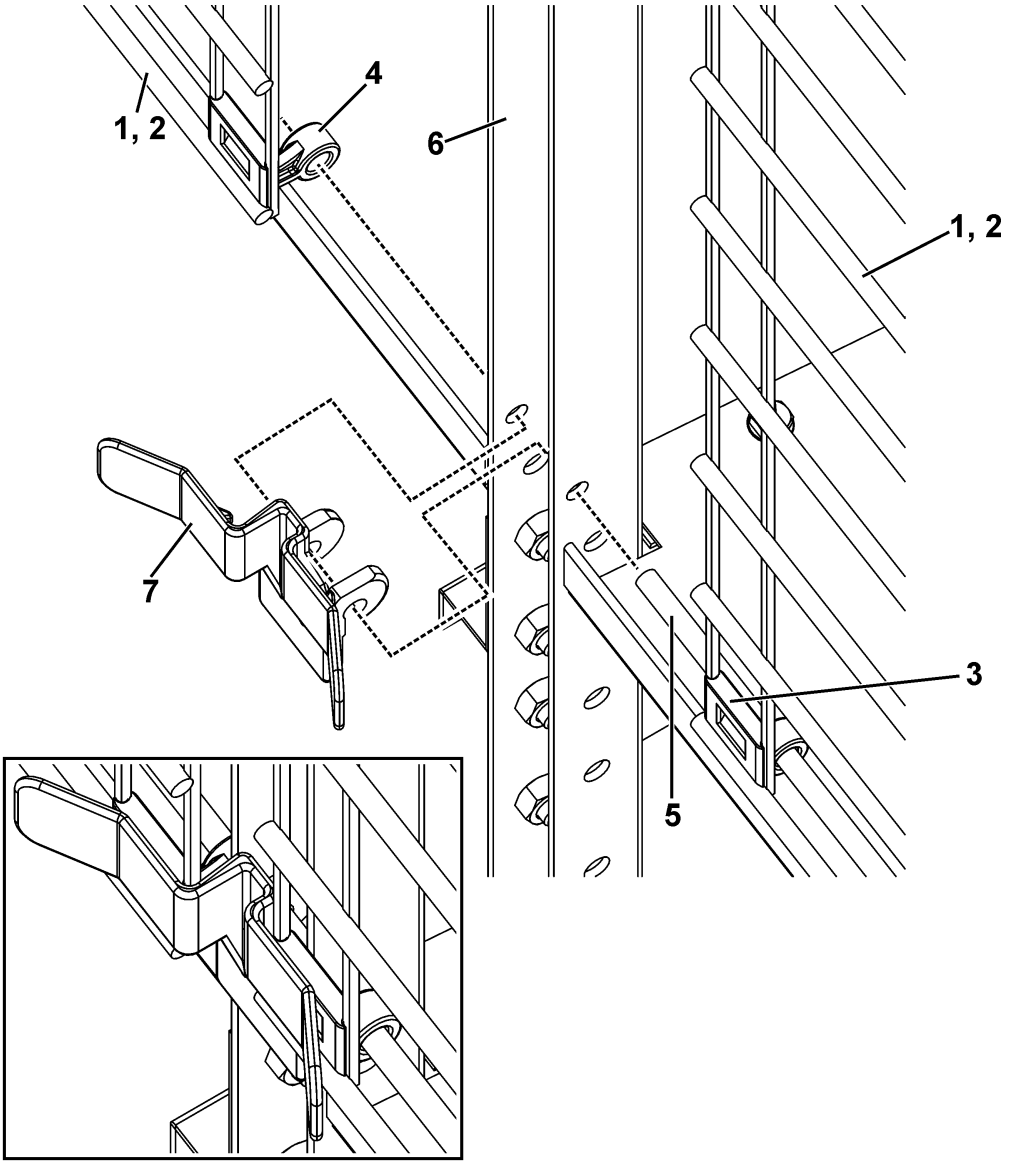
16.3.2 Inserting the lower rods and the fasteners for the sliding fronts

	At every main post of the cage stands, a "fastener POM open for cage front UV-S" has to be attached to the lower part of the cage front.

Positions of the fasteners for cage fronts



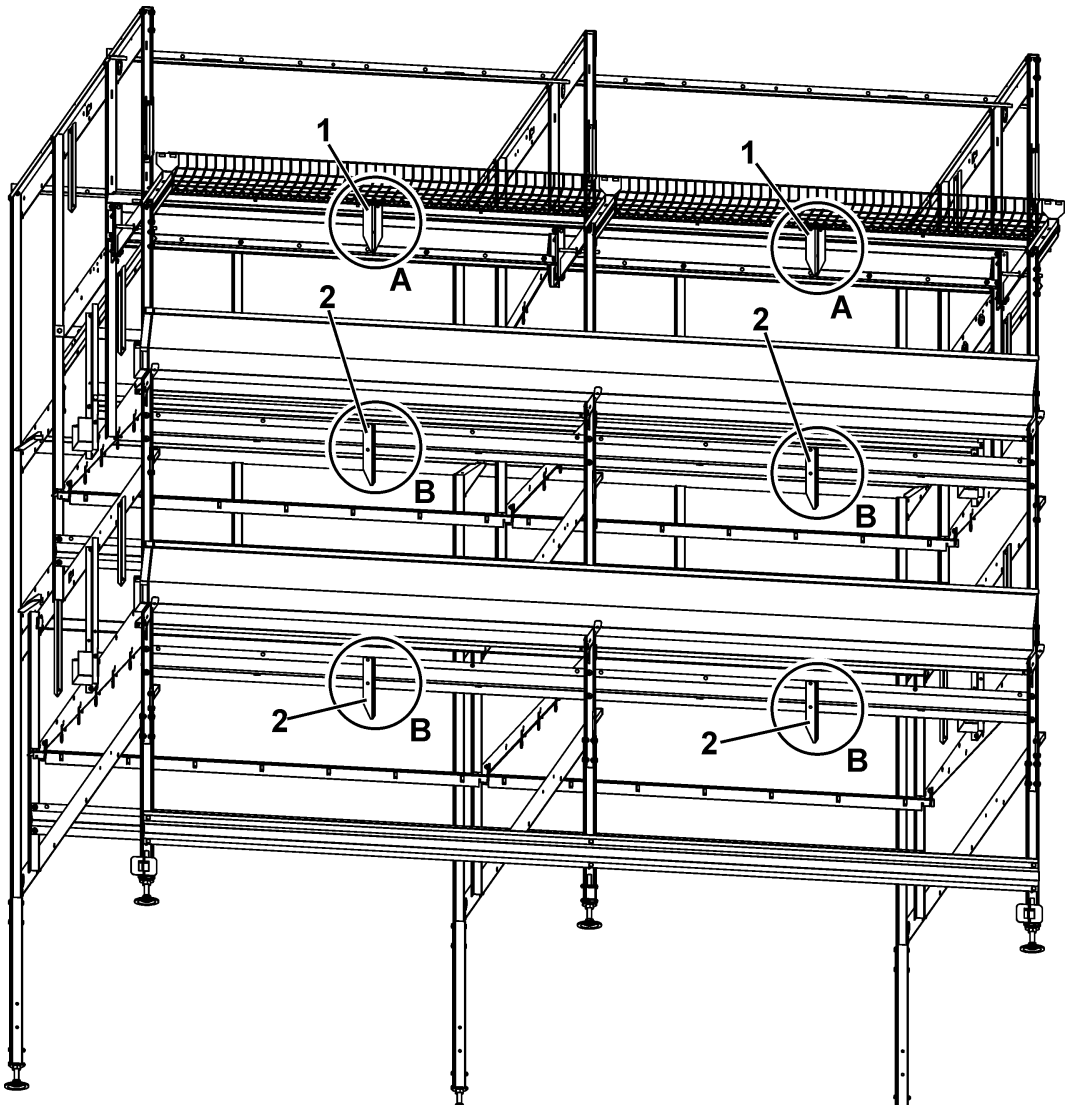
Insertion of the cage fronts and fasteners



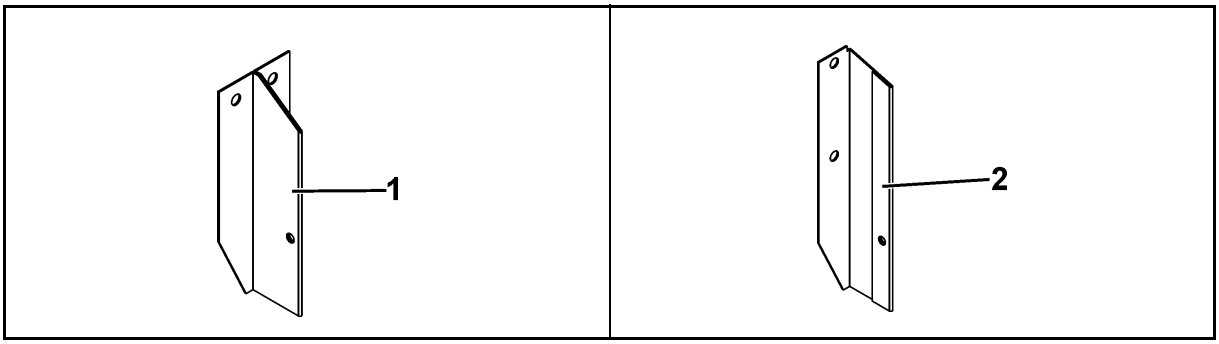
Pos.	Qty.	Code no.	Description
1	2	83-03-9750	sliding front cpl upper staircase (bl) NAT-60/BD-C2+
	2	83-03-9751	sliding front cpl upper staircase (bs) NAT-60/BD-C2+
2	2	83-03-9747	sliding front cpl lower staircase (bl) NAT-60/BD-C2+
	2	83-03-9748	sliding front cpl lower staircase (bs) NAT-60/BD-C2+
3	16	83-00-2768	bracket POM for sliding front 603 UV-S (bs)
4	16	83-00-2769	bracket POM for sliding front 603 UV-S (bl)
5		83-00-2932	rod 5x4820 galv.
6	3	83-03-9708	post staircase NAT-60
7	6	83-00-8305	fastener POM open for cage front UV-S

16.4 Assembly of the sliding fronts below the nest

16.4.1 Assembly of the T-brackets and support angles for fastener sliding front

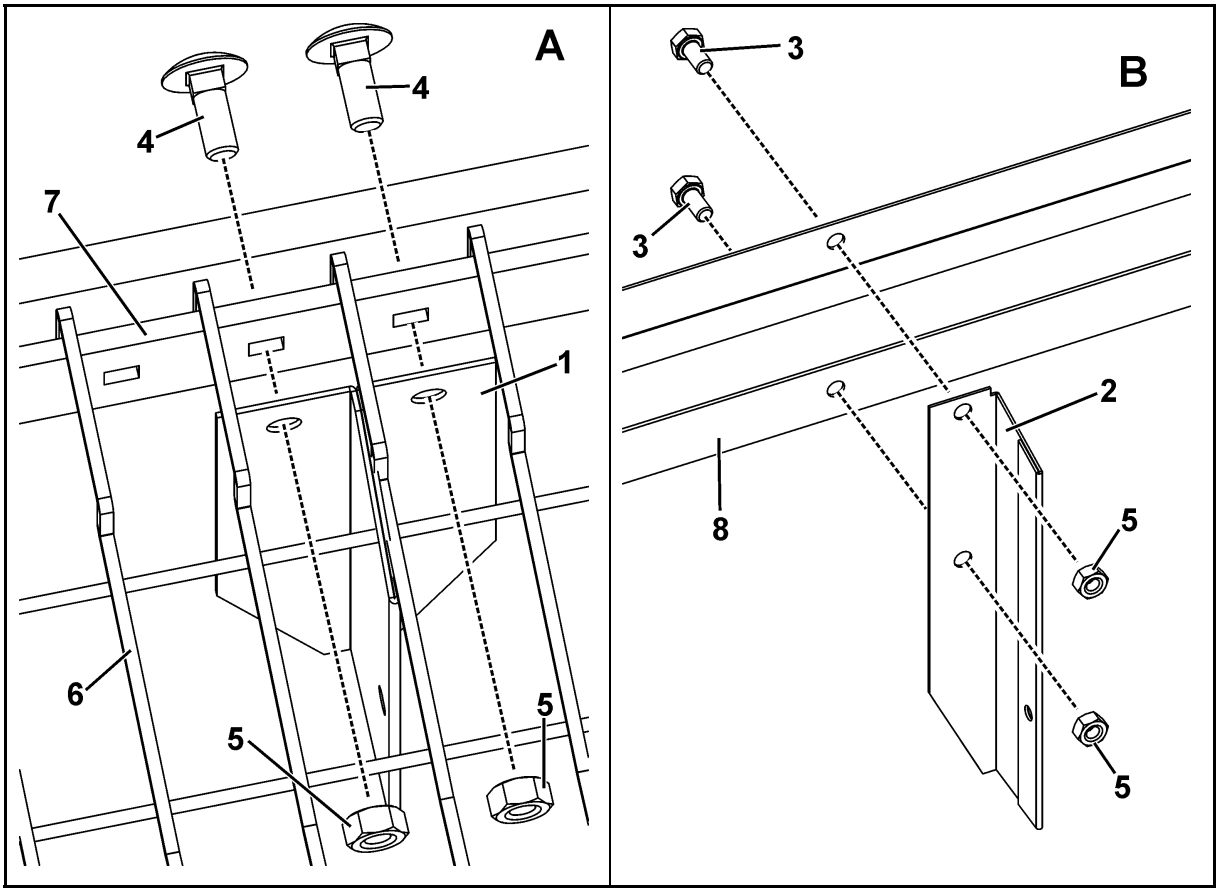


Pos.	Qty.	Code no.	Description
1	2	83-03-9754	T-bracket for fastener cage front feeding side NAT-60
2	4	83-03-9753	support angle for fastener cage front feeding side NAT-60



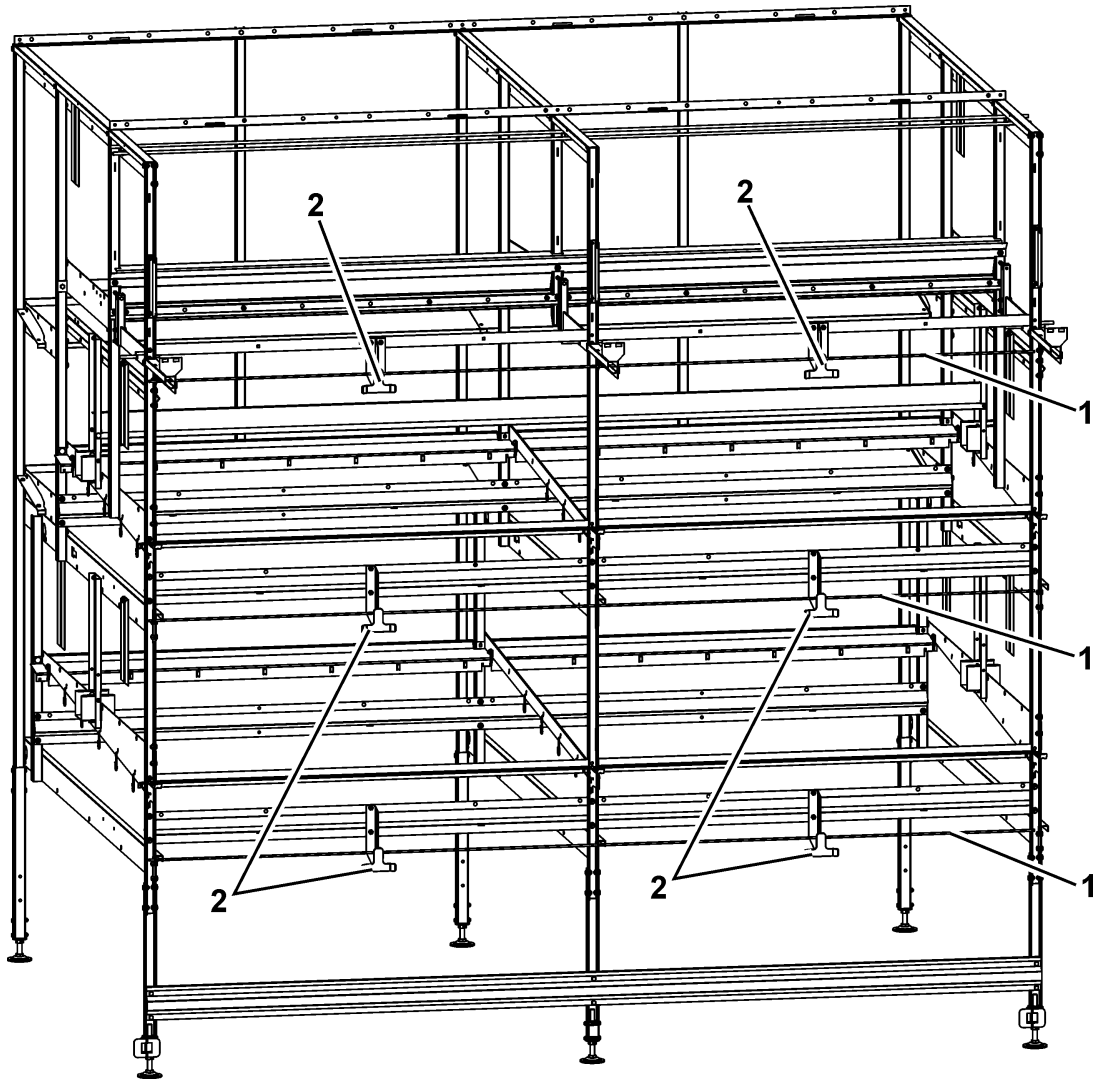
The T-brackets (1) and the egg channel grids (6) are screwed together to the "support for wire grilles" (7).

For this, 2 mushroom head square neck bolts M6x16 (4) and nuts M6 (5) are required.



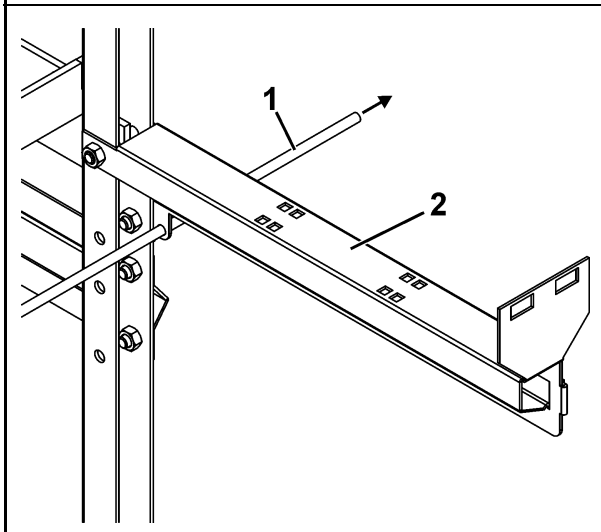
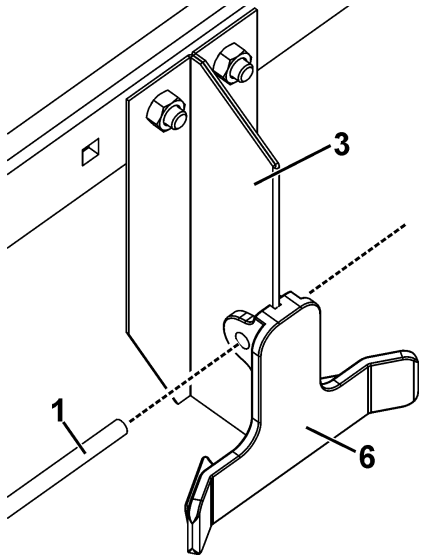
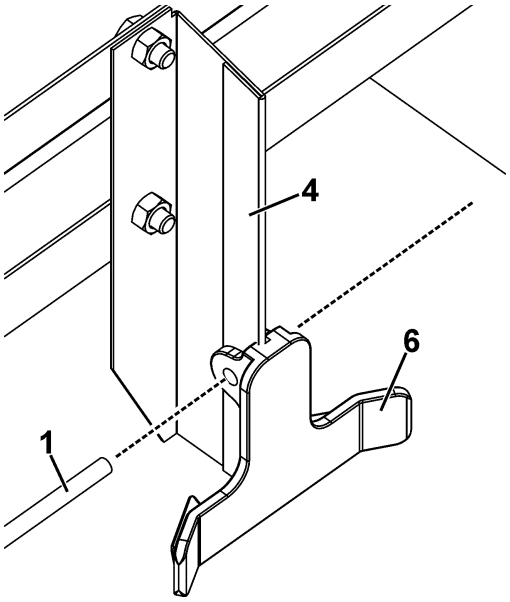
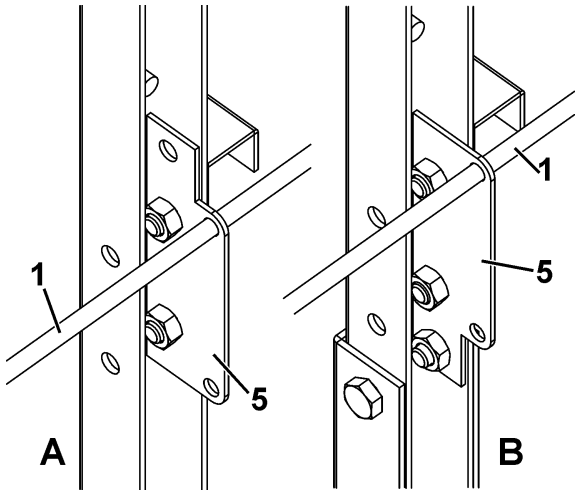
Pos.	Qty.	Code no.	Description
1	2	83-03-9754	T-bracket for fastener cage front feeding side NAT-60
2	4	83-03-9753	support angle for fastener cage front feeding side NAT-60
3	8	99-10-1100	hexagon head screw M 6x12 galv.
4	4	99-10-3872	mushroom head screw M 6x16 slotted galv
5	12	99-10-1045	hexagon nut M 6 galv. DIN 934-8
6	1	83-03-9528	wire grille 2412 for egg channel LB 245 NAT-60 BD-C2+ (ZnAl)
7	1	83-03-9732	support 2412 wire grille for egg channel LB245 NAT-60 BD-C2+
8	2	83-03-9725	side rail 2412 MB NAT-60

16.4.2 Inserting the rods and the fasteners for the sliding fronts



Pos.	Qty.	Code no.	Description
1		83-00-2932	rod 5x4820 galv.
2	6	83-00-5297	fastener orange f/ cage front EV-EU

Insertion of the rods in:

Support for egg channel	T-bracket for fastener
	
Support angle for fastener	**Guide rail for sliding cage front wire**
	

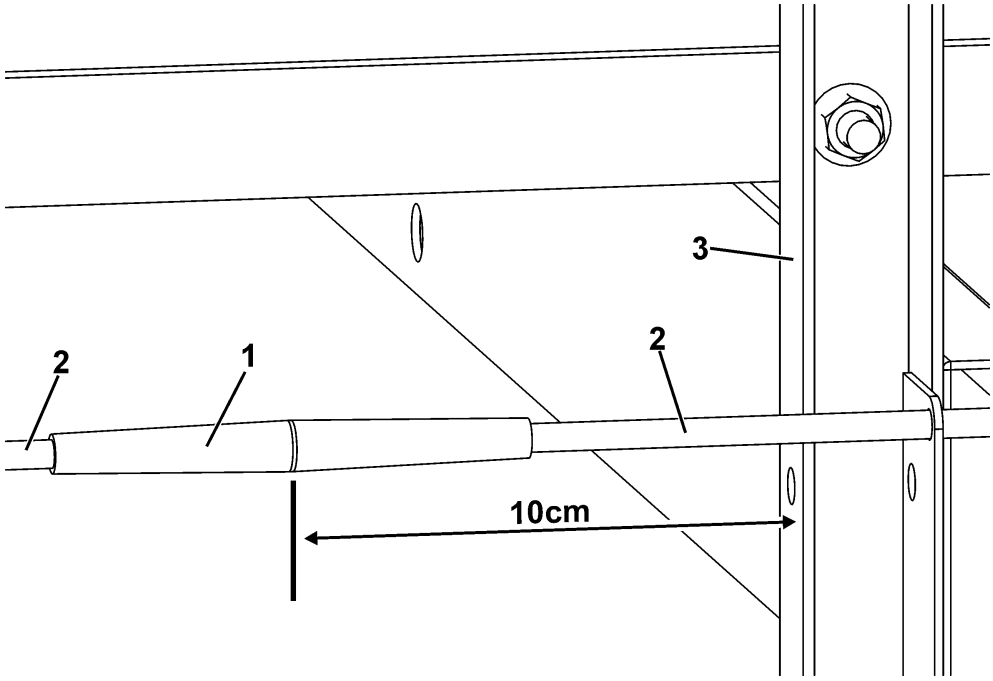
A= Guide rail for sliding cage front wire in central tier

B= Guide rail for sliding cage front wire in lower tier

Pos.	Qty.	Code no.	Description
1		83-00-2932	rod 5x4820 galv.
2	2	83-03-9693	support for egg channel LB245 nest NAT-60 BD-C2+
3	2	83-03-9754	T-bracket for fastener cage front feeding side NAT-60
4	4	83-03-9753	support angle for fastener cage front feeding side NAT-60
5	2	83-03-9807	guide f/wire of sliding front at feeding side NAT-60
6	6	83-00-5297	fastener orange f/ cage front EV-EU

16.4.2.1 Connecting the rods

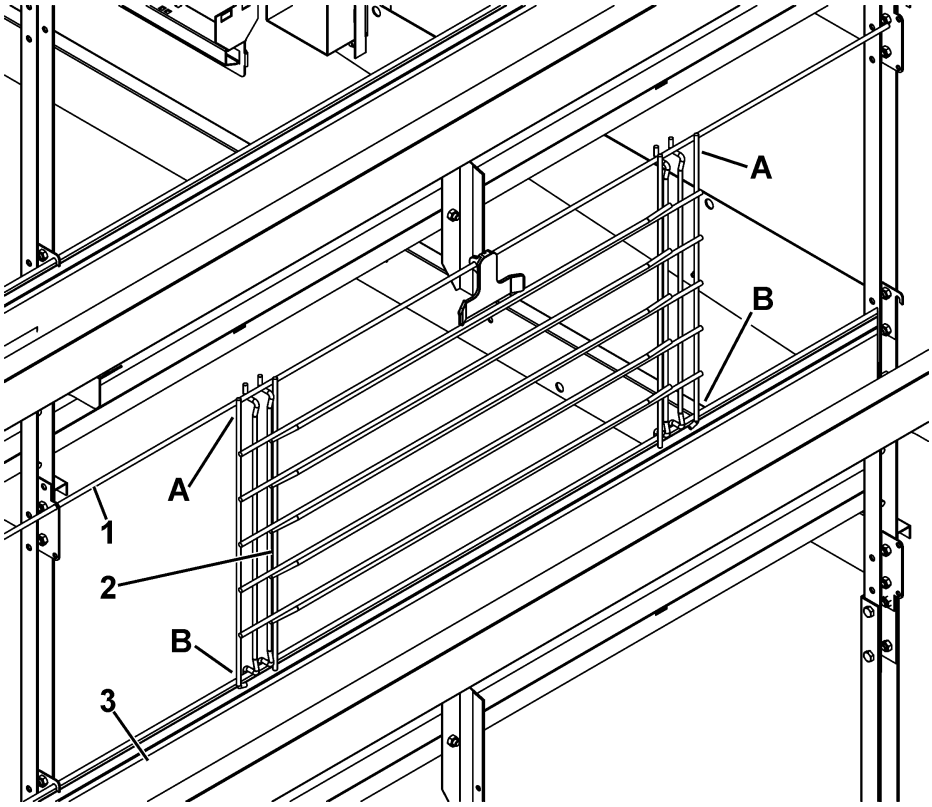
☞	To ensure that the cage front guidance glides along the rod without problems, the connection tubes have to be mounted at a distance of **approx. 10cm away from the posts** in **all** tiers. At **less distance** the cage fronts cannot be closed. At a **larger distance** the rods are weakened too much and birds might get out of the cages.



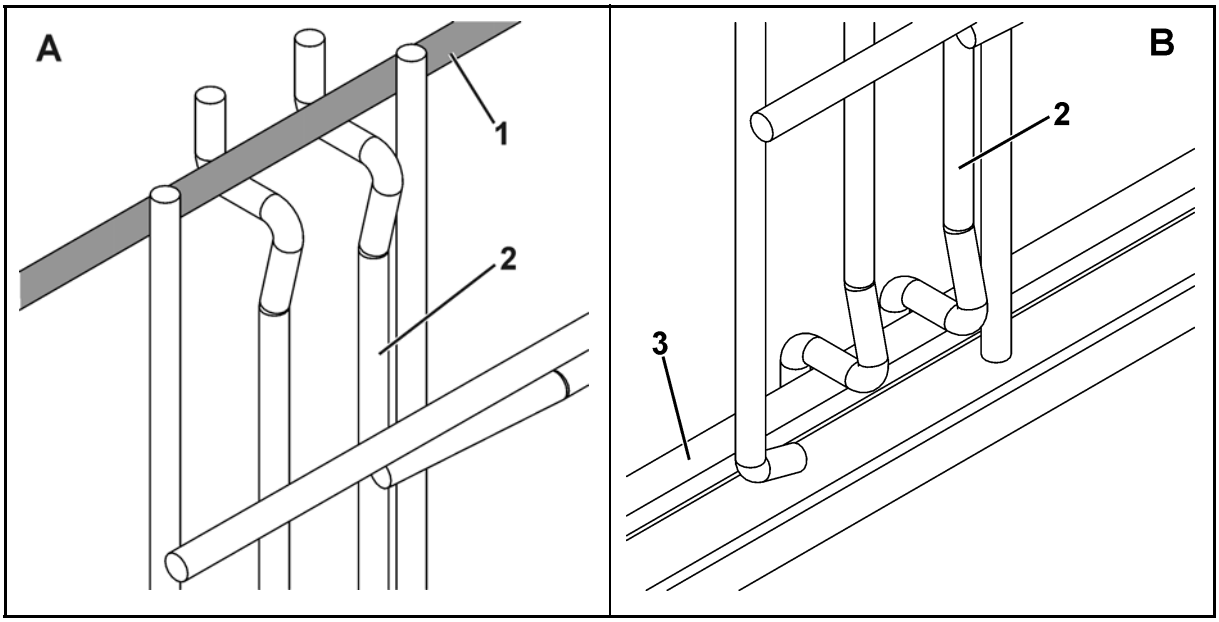
Pos.	Qty.	Code no.	Description
1		83-00-2932	rod 5x4820 galv.
2	2	39-00-3730	connection tube dia 5mm PA
3	2		stand post

16.4.3 Inserting the cage fronts

16.4.3.1 Insertion at the feed trough

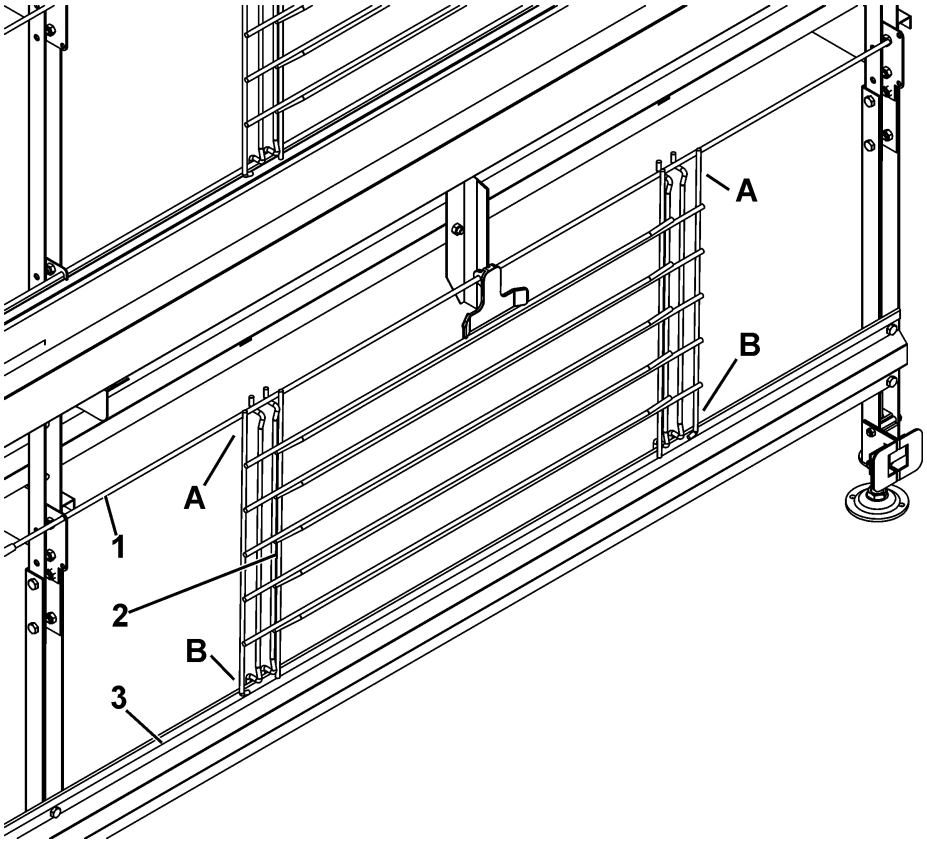


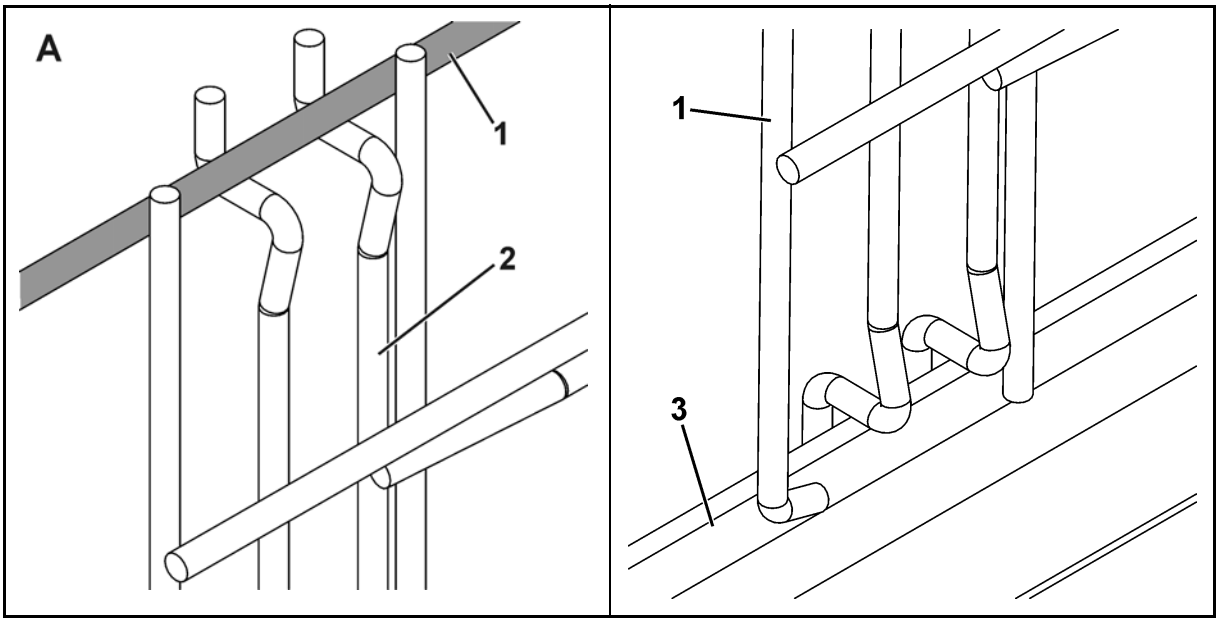
In a first step, the front grids are set **centrally** onto the edge of the feedtroughs with the bottom guidances (detail B). Push the rods towards the top to now also insert the upper guidances of the cage fronts (detail A) at the rods.



Pos.	Qty.	Code no.	Description
1		83-00-2932	rod 5x4820 galv.
2	4	83-01-2778	cage front EV625-EU 0103 (ZnAl)
3	2	83-00-4344	feedtrough 2412 pluggable ccw EV/UV

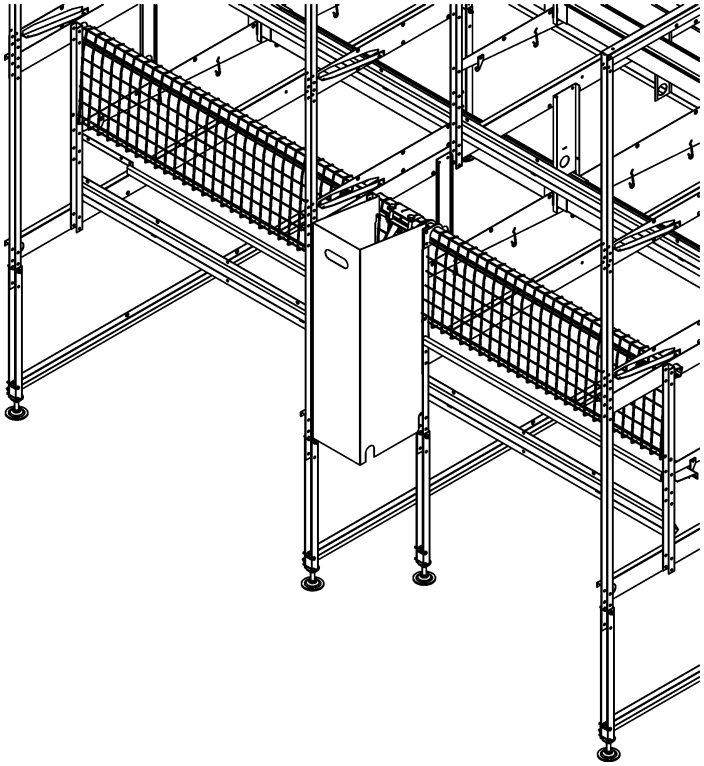
16.4.3.2 Insertion of the side rails in the scratching area





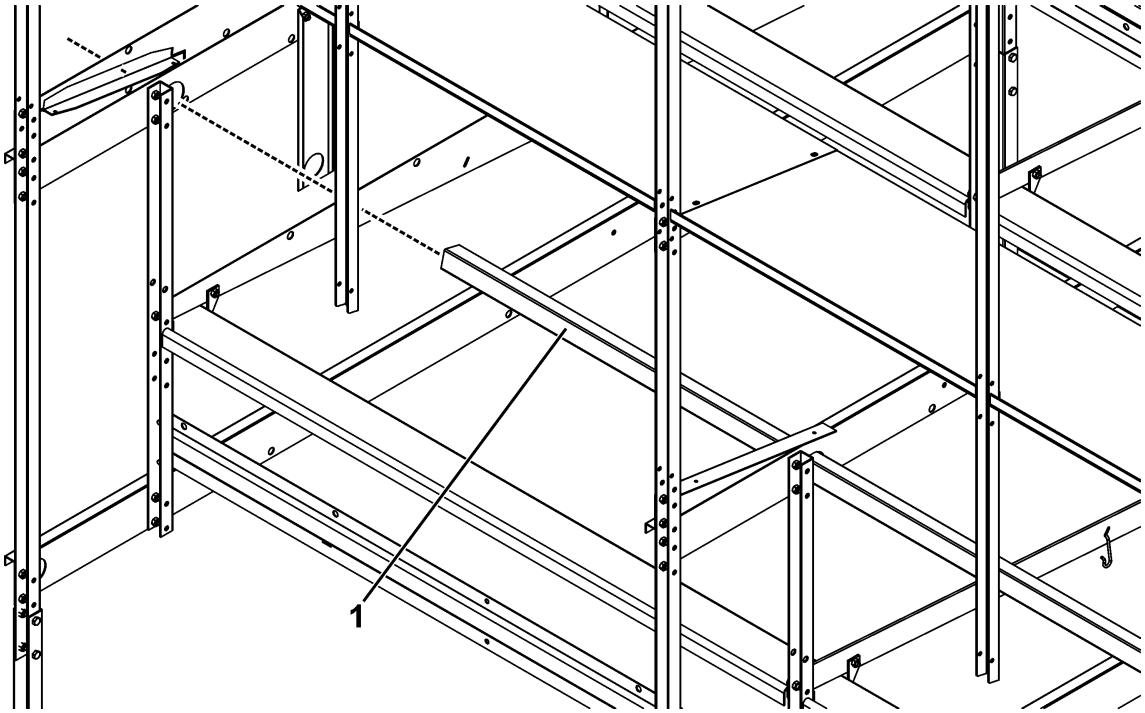
Pos.	Qty.	Code no.	Description
1		83-00-2932	rod 5x4820 galv.
2	2	83-01-2778	cage front EV625-EU 0103 (ZnAl)
3	1	83-04-1191	side rail 2412 scratching area NAT-60

16.5 Assembly of the collapsible grids



16.5.1 Insertion of the square tube

!	**Important:** If a **drive for the collapsible grilles** is to be installed, the **exact position** of the drive in the row has to be determined before the rectangular tubes are inserted. An **additional bearing sheet** has to be **inserted** on the rectanguar tube at the position of the drive. (see chapter 16.5.3)



Pos.	Qty.	Code no.	Description
1		99-40-3102	rectangular tube 30x30x2-6000 galv DIN 2395

16.5.1.1 Coupling the rectangular tube

Important:

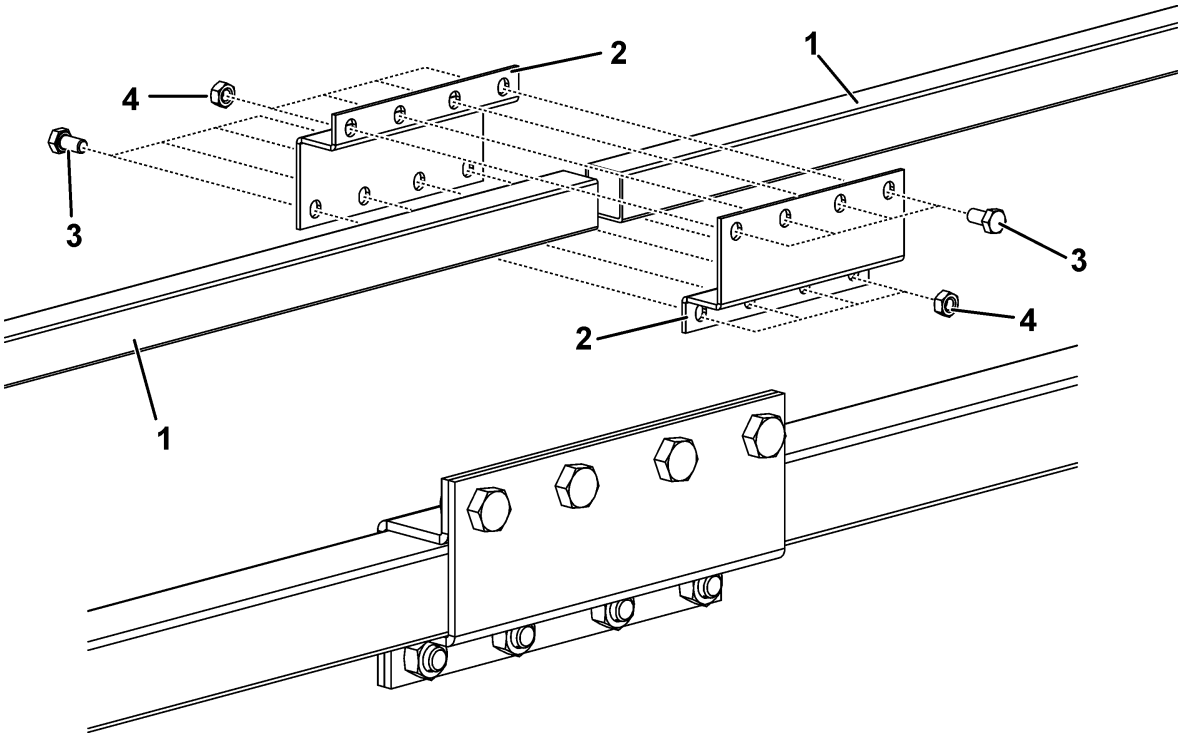
If more than one drive unit is required in one nest row, the rectangular tubes of two successive drive units **must not be firmly connected end-to-end**.

The following applies:

– All rectangular tubes that belong to **one drive unit** are firmly connected.

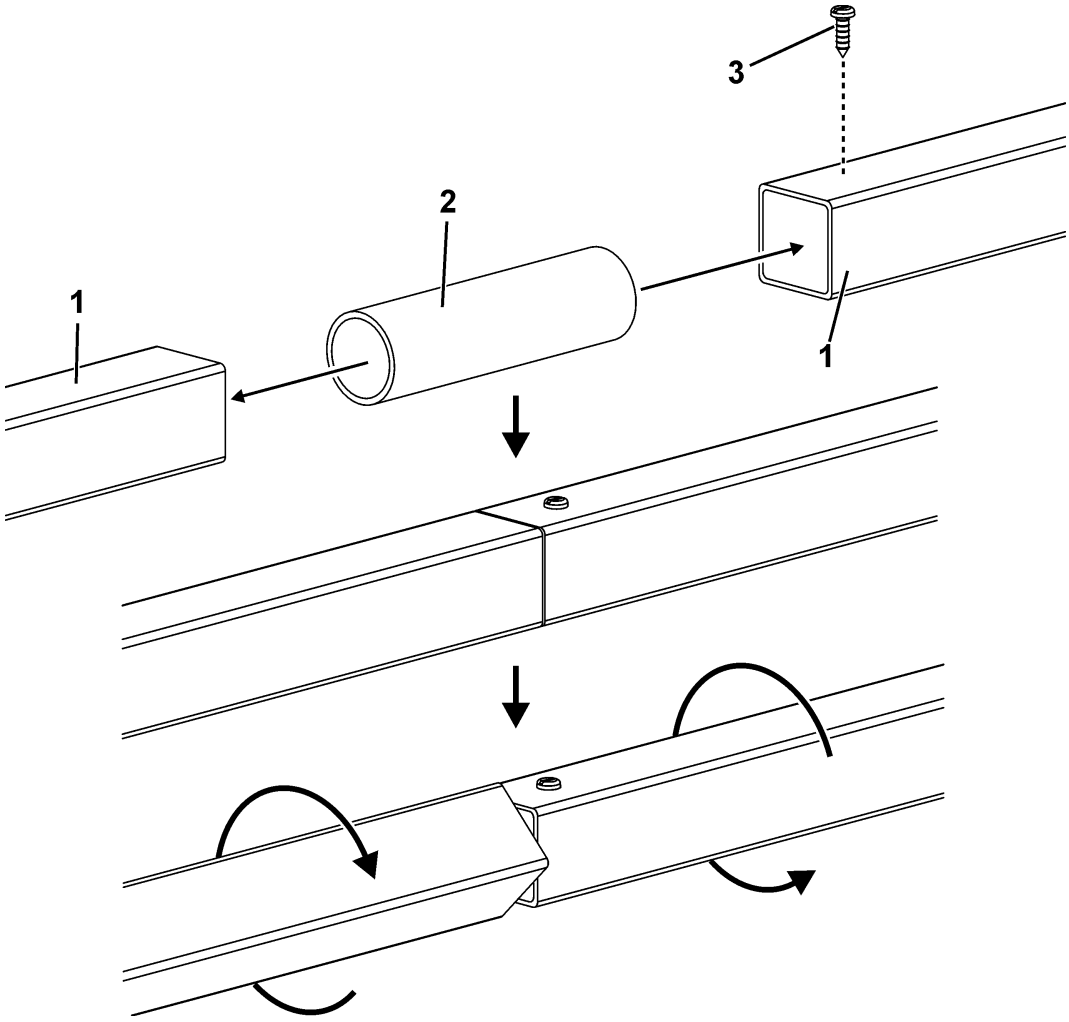
– Where rectangular tubes **of two different, consecutive drive units** meet, they are coupled flexibly.

Fixed coupler of the rectangular tubes:



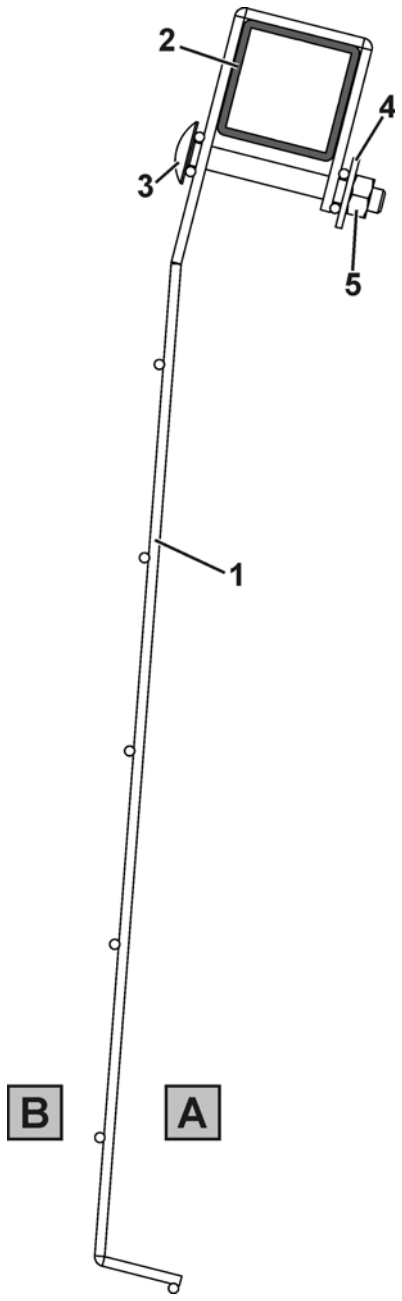
Pos.	Qty.	Code no.	Description
1		99-40-3102	rectangular tube 30x30x2-6000 DIN 2395 galv
		36-00-6602	roupler cplt for rectangular tube 30x30 **consists of:**
2	2	83-02-6231	roupler half for rectangular tube 30x30x2
3	8	99-10-1046	hexagon head screw M 8x 16 galv DIN 558
4	8	99-10-1040	hexagon nut M 8 galv DIN 934-8

Flexible coupler of the rectangular tube between two different drive units:



Pos.	Qty.	Code no.	Description
1		99-40-3102	Rectangular tube 30x30x2-6000 DIN 2395 galv
2			Round tube 30x30x2-6000 galv
3	1		drilling screw

16.5.2 Insertion and screwing of the collapsible grids



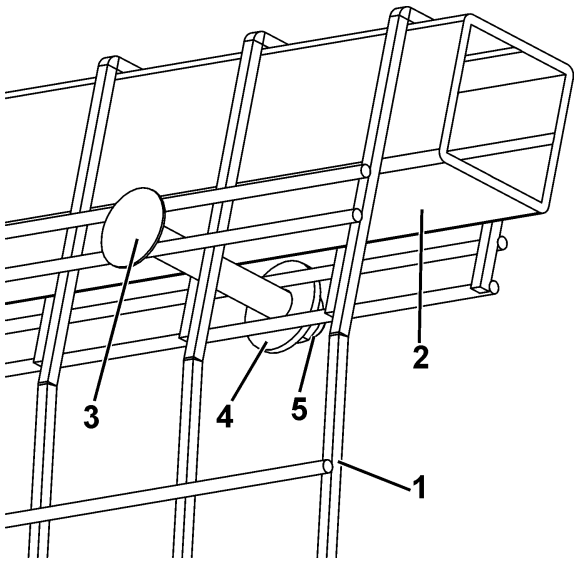
A= inside of a section

B= outside of a section

Every grid has to be screwed to the rectangular tube by means of 3 mushroom head square neck bolts, washers and nuts.

The screw positions at the collapsible grid are located:

1. on the left and right hand side of each grid, between the 2nd and 3rd cross wire and
2. in the centre of the grid



Pos.	Qty.	Code no.	Description
1	1	83-03-9662	collapsible grille 1206 scratching area NAT-60 BD-C2+ (ZnAl)
2		99-40-3102	rectangular tube 30x30x2-6000 galv DIN 2395
3	3	99-10-3878	mushroom head square neck bolt M6x45 DIN 603 galv
4	3	99-20-1170	washer A 6,4x18x1,5 DIN 9021 galv
5	3	99-10-1045	hexagon nut M 6 galv. DIN 934-8

16.5.3 Assembling the drive for collapsible grille (option)

Important:

1 drive unit is installed for rows with a maximum length of 35 m!

This means for row lengths

up to 35m

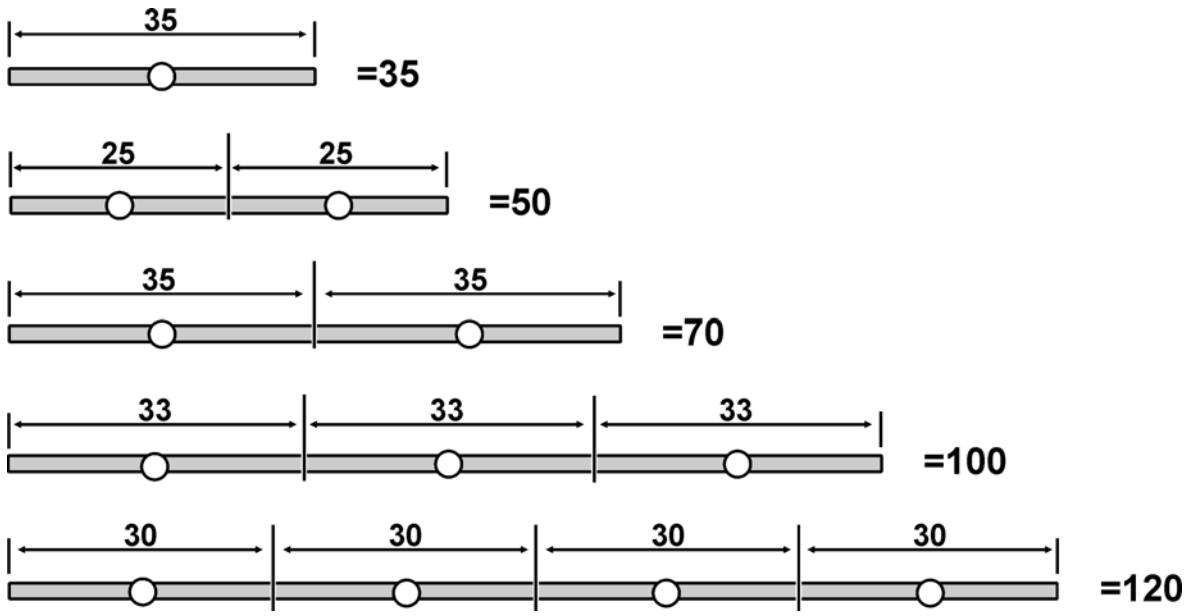
– one drive unit is installed in the centre of the row

more than 35m

– Several drive units are needed, equally distributed along the entire nest row. **One drive unit** each for **max.** 35m.

See below illustration. Each circle stands for a drive unit.

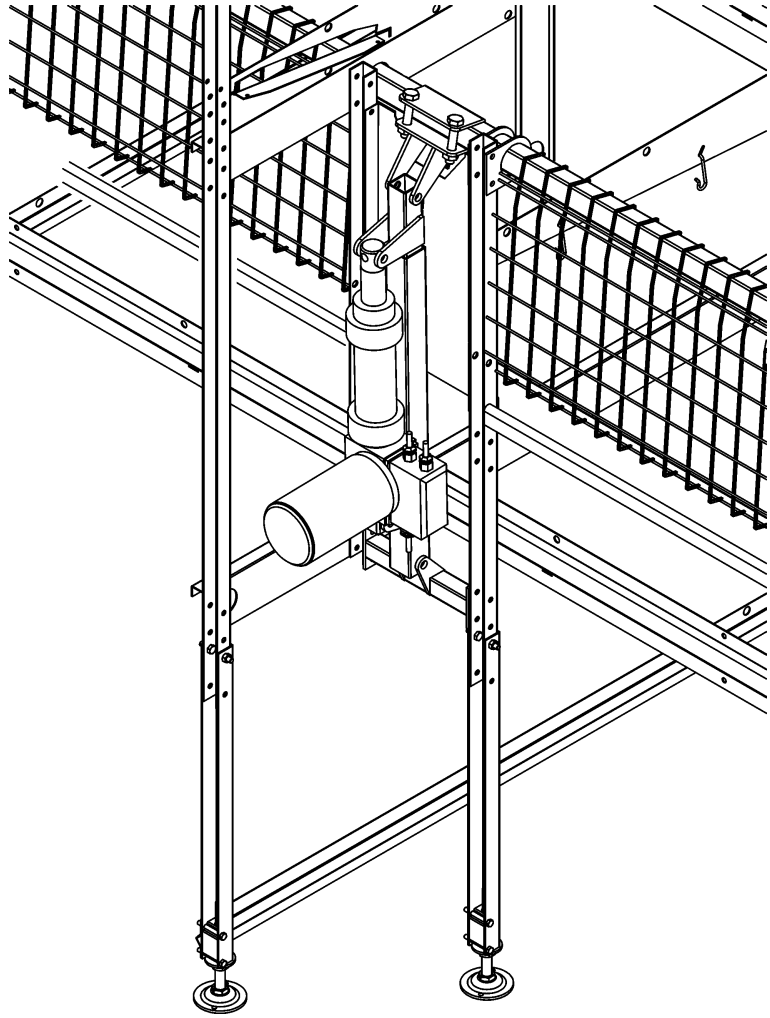
Distribution of drive units in rows of different lengths (all measures in m)



Important:

If a **drive for the collapsible grilles** is to be installed, the **exact position** of the drive in the row has to be determined before the rectangular tubes are inserted.

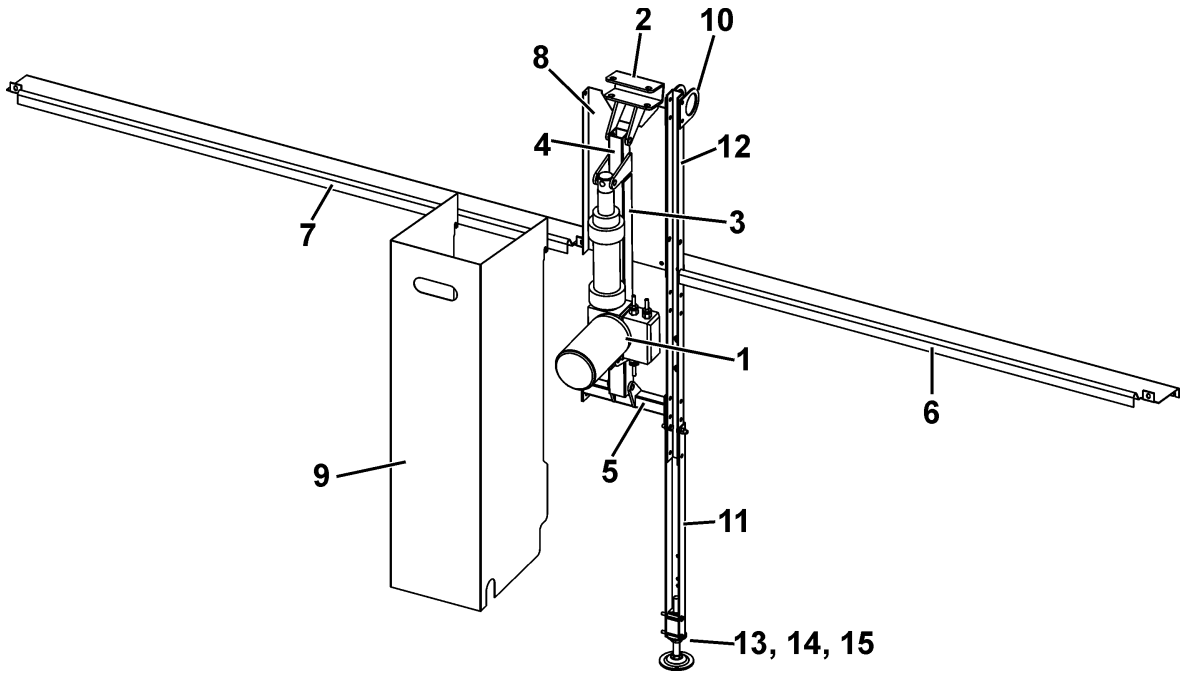
An **additional bearing sheet** has to be **inserted** on the rectanguar tube at the position of the drive.



Overview:

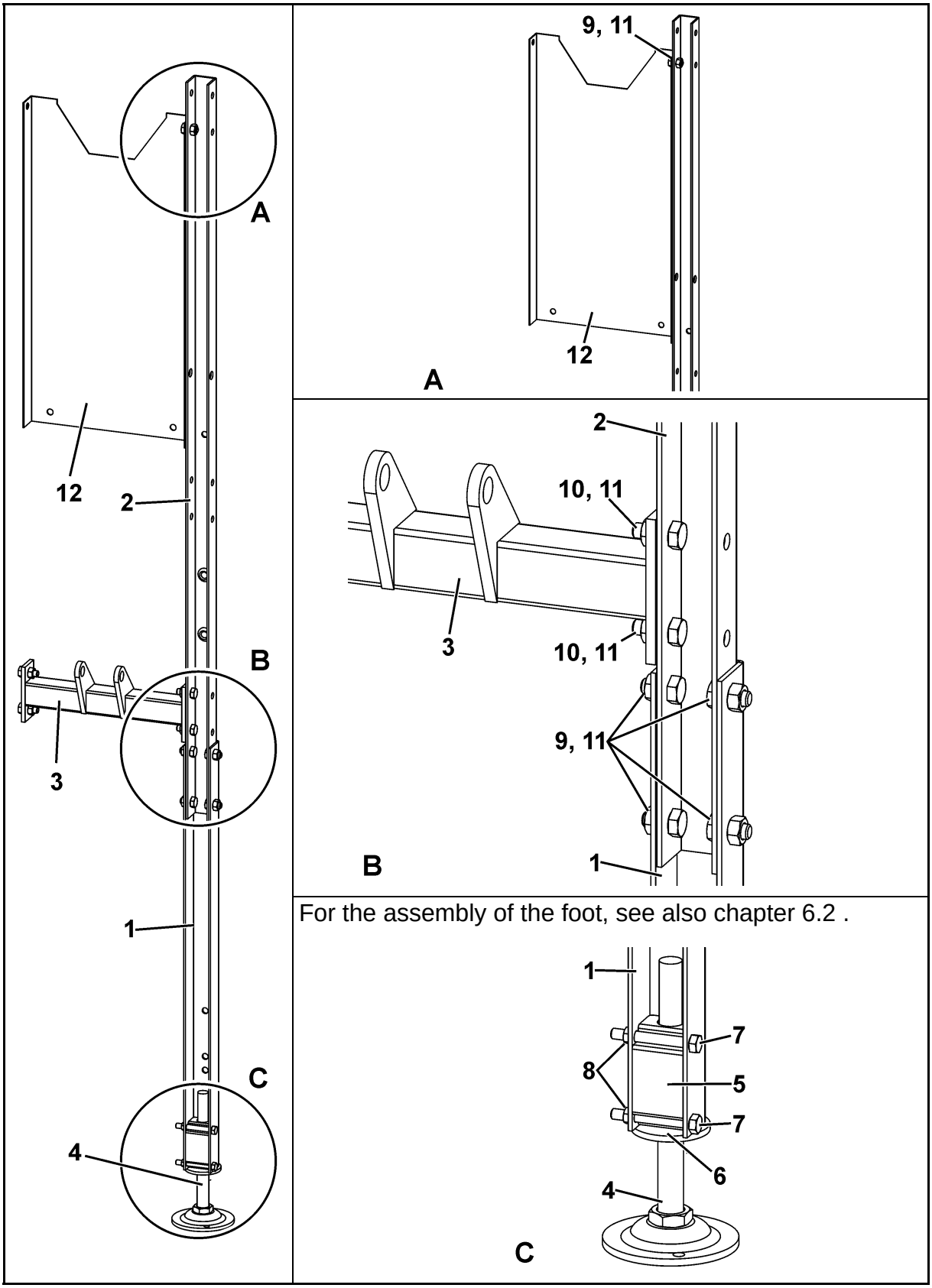
Position of the drive for collapsible grille in the section.

16.5.3.1 Components of drive for collapsible grille



Pos.	Qty.	Code no.	Description
1	1	36-00-6630	Drive f/eject. mechanism sgl 230V length of stroke 125mm
2	1	83-04-2501	Pipe clamp 30x30 60deg 95mm drive of collaps. grill NAT-60
3	1	83-04-2510	Guidance outer for telescope drive of collaps. grille aut.
4	1	83-04-2512	Guidance inner for telescope drive collaps. grille aut. NAT
5	1	83-04-2506	Motor brace linear-motor drive of collaps. grille aut. NAT-60
6	1	83-04-2498	Sheet metal perch 1206 112mm drive collaps. grille aut. NAT
7	1	83-04-1202	Sheet metal perch 1206 112mm wide NAT-60
8	1	83-04-2497	Cover plate inner for drive of collapsible grille aut. NAT-60
9	1	83-04-2496	Covering in front of drive of collapsible grille aut. NAT-60
10	1	83-04-2502	Bearing sheet for square tube 30x30 drive of collaps. grille
11	1	83-03-9699	Post SST 600mm for holding plate NAT-60
12	1	83-04-2499	Supporting pors addit. f/drive of collaps. grille aut. NAT-60
13	1	37-97-4317	Foot adjustable M12x140 PA/SST cpl
14	1	83-03-9793	Holding plate SST at main post NAT-60
15	1	99-20-1609	Washer A 13,0x37x3,0 DIN 9021 SST

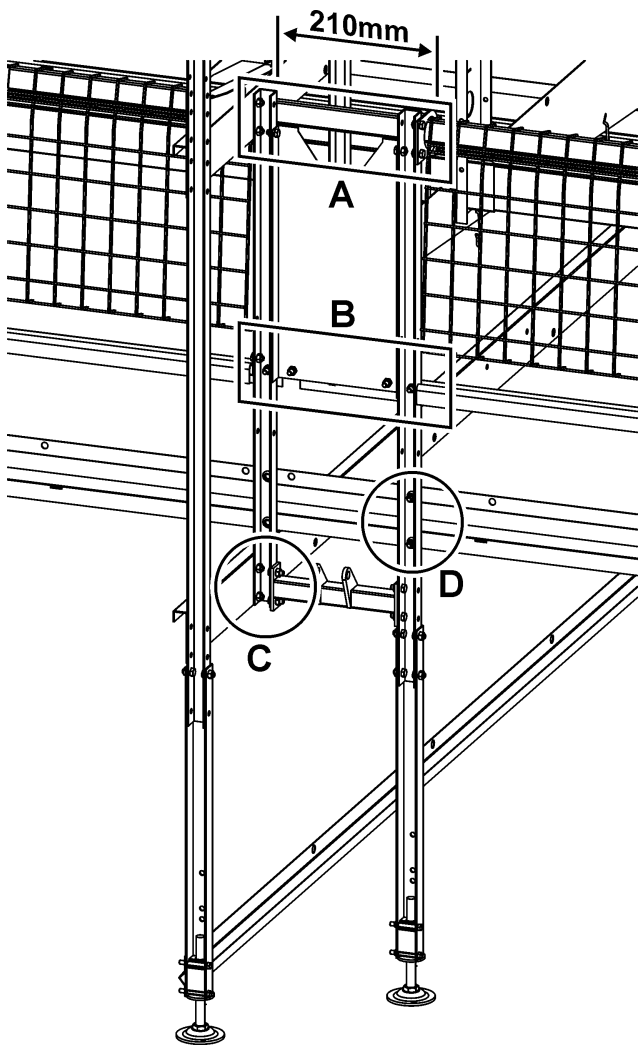
16.5.3.2 Pre-assembly of the support



position numbers see the following page

Pos.	Qty.	Code no.	Description
1	1	83-03-9699	post SST 600mm for holding plate NAT-60
2	1	83-04-2499	supporting pors addit. f/drive of collaps. grille aut. NAT-60
3	1	83-04-2506	motor brace linear-motor drive of collaps. grille aut. NAT-60
4	1	37-97-4317	foot adjustable M12x140 M12x140 PA/SST kplt
5	1	83-03-9793	holding plate SST at main post NAT-60
6	1	99-20-1609	washer A 13,0x37x3,0 DIN 9021-Edelstahl
7	2	99-10-3824	hexagon head screw M 5x 40 galv. DIN 558
8	2	99-10-1023	hexagon nut M 5 galv. DIN 934-8
9	5	99-10-1100	hexagon head screw M 6x 12 galv. DIN 933 8.8
10	2	99-10-1067	hexagon head screw M 6x 16 galv. DIN 933 8.8
11	7	99-10-1045	hexagon nut M 6 galv. DIN 934-8
12	1	83-04-2497	cover plate inner for drive of collapsible grille aut. NAT-60

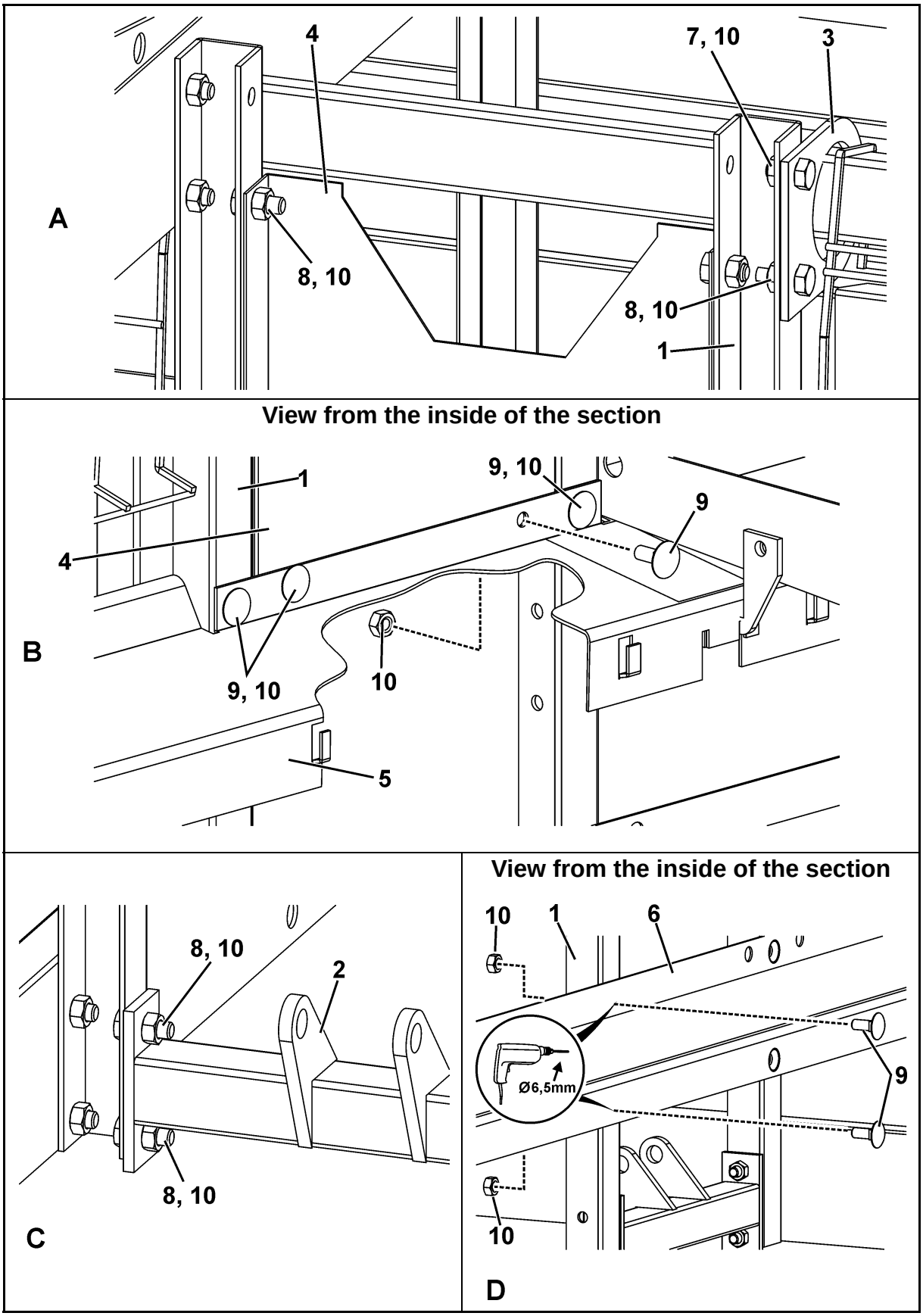
16.5.3.3 Assembly of the support into the section



Important:

Before the monting of the support to the section, the **individual wires of the collapsible grilles** have to be **shortened** by approx. 210 mm in this area.

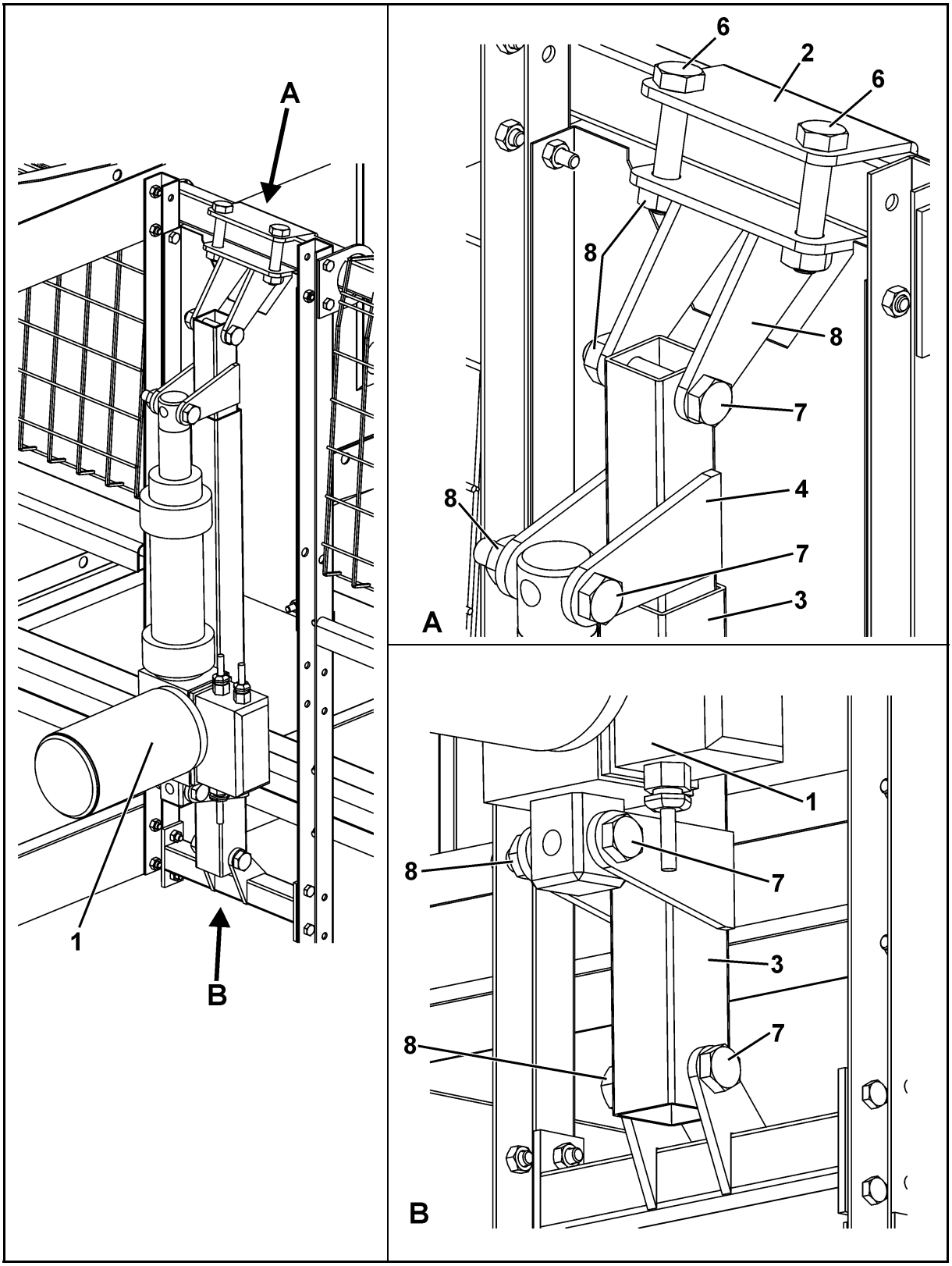
details: see the following page



position numbers see the following page

Pos.	Qty.	Code no.	Description
1	1	83-04-2499	supporting pors addit. f/drive of collaps. grille aut. NAT-60
2	1	83-04-2506	motor brace linear-motor drive of collaps. grille aut. NAT-60
3	1	83-04-2502	bearing sheet for square tube 30x30 drive of collaps. grille
4	1	83-04-2497	cover plate inner for drive of collapsible grille aut. NAT-60
5	1	83-04-2498	sheet metal perch 1206 112mm drive collaps. grille aut. NAT
6	4	83-03-9725	side rail 2412 KB NAT-60
7	4	99-10-1100	hexagon head screw M 6x 12 galv. DIN 933 8.8
8	2	99-10-1067	hexagon head screw M6x 16 galv. DIN 933 8.8
9	3	99-10-3872	mushroom head screw M 6x 16 galv. slotted
10	6	99-10-1045	hexagon nut M6 galv. DIN 934-8

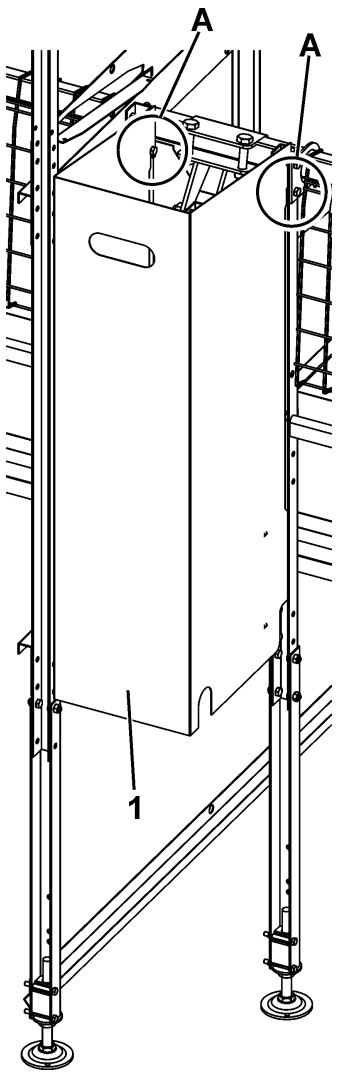
16.5.3.4 Fixing of the drive to the rectangular tube and motor brace

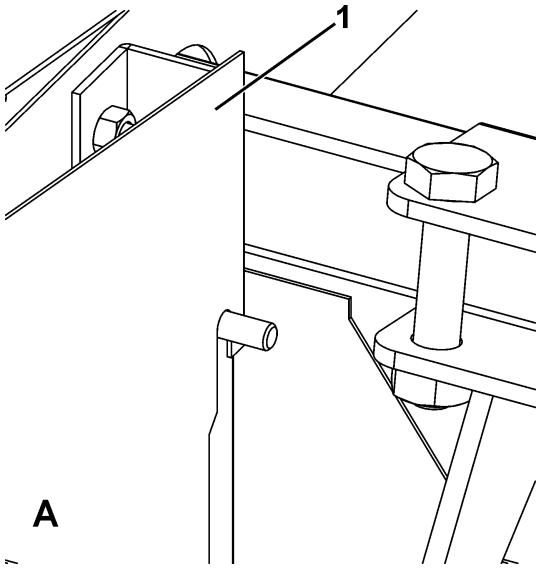


position numbers see the following page

Pos.	Qty.	Code no.	Description
1	1	36-00-6630	drive f/eject. mechanism sgl 230V length of stroke 125mm
2	1	83-04-2501	pipe clamp 30x30 60deg 95mm drive of collaps. grill NAT-60
3	1	83-04-2510	guidance outer for telescope drive of collaps. grille aut.
4	1	83-04-2512	guidance inner for telescope drive collaps. grille aut. NAT
5	1	83-04-2506	motor brace linear-motor drive of collaps. grille aut. NAT-60
6	2	99-10-1258	hexagon head screw M 10x 50 galv. DIN 558
7	4	99-10-1236	hexagon head screw M 10x 60 galv. DIN 558
8	6	99-20-1029	hexagon nut M 10 galv. DIN 555

16.5.3.5 Inserting the front covering



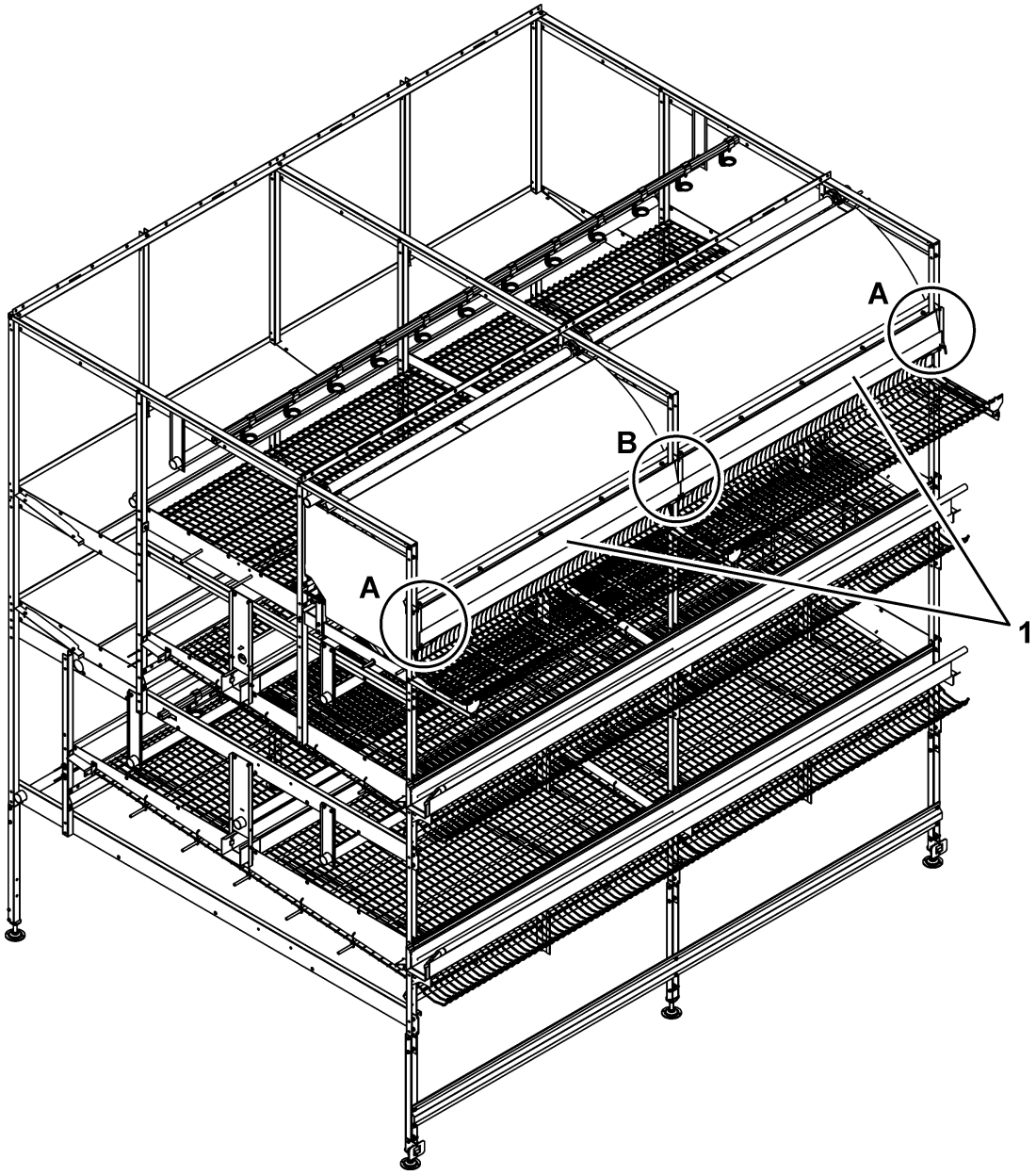


The front covering will be hooked to the overlappling ends of the screws at positions A.

Pos.	Qty.	Code no.	Description
1	1	83-04-2496	covering in front of drive of collapsible grille aut. NAT-60

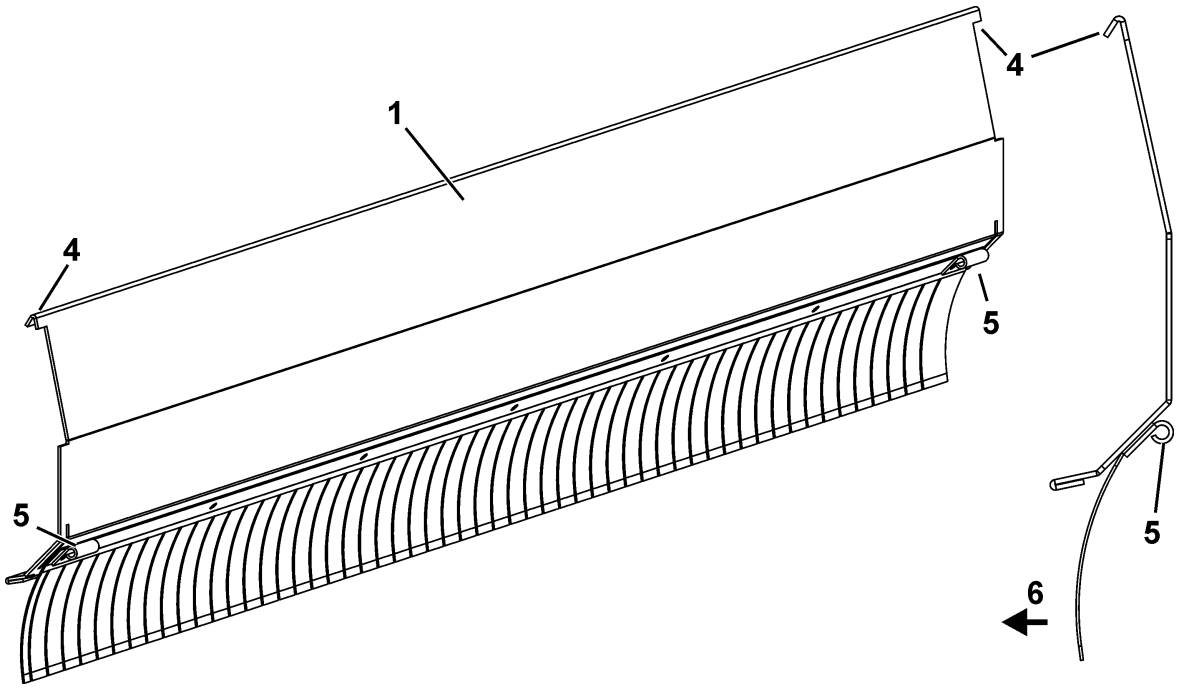
17 Assembly of the foot rails behind the nest

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

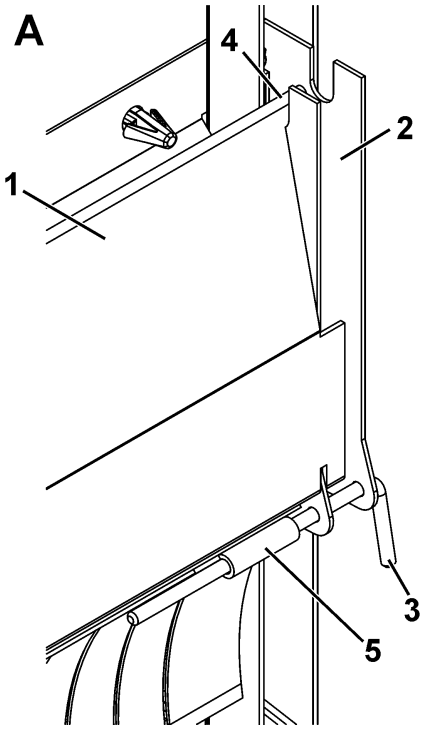
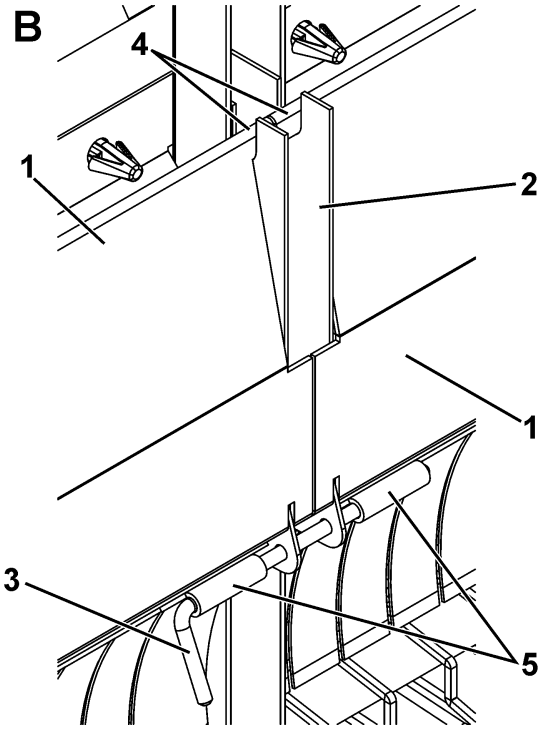


details A and B: see the following page

Pos.	Qty.	Code no.	Description
1	2	83-03-9745	footrail 1206 collaps. for nest NAT-60 BD-C2+



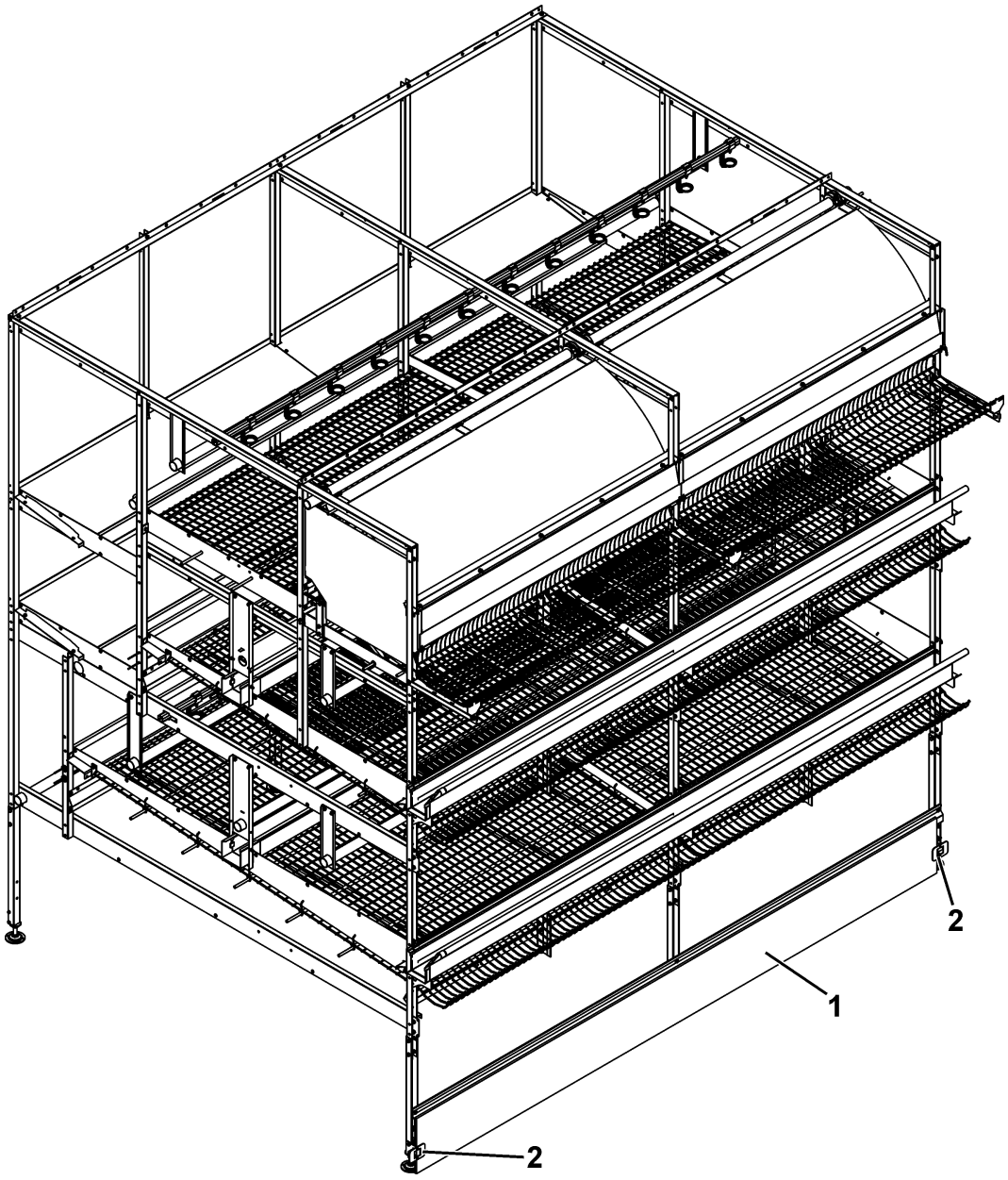
Pos.	Qty.	Code no.	Description
1	2	83-03-9745	footrail 1206 collaps. for nest NAT-60 BD-C2+
2	3	83-03-9696	fastening f/footrail collaps. for nest NAT-60 BD-C2+
3	3	83-03-9924	lock-pin double f/ footrail collapsible Natura 60
4			shackle for insertion into fastening for footrail
5			guide rail for locking pin
6			inside of nest

Detail A: beginning and end of a row	Detail B: centre of a row
	

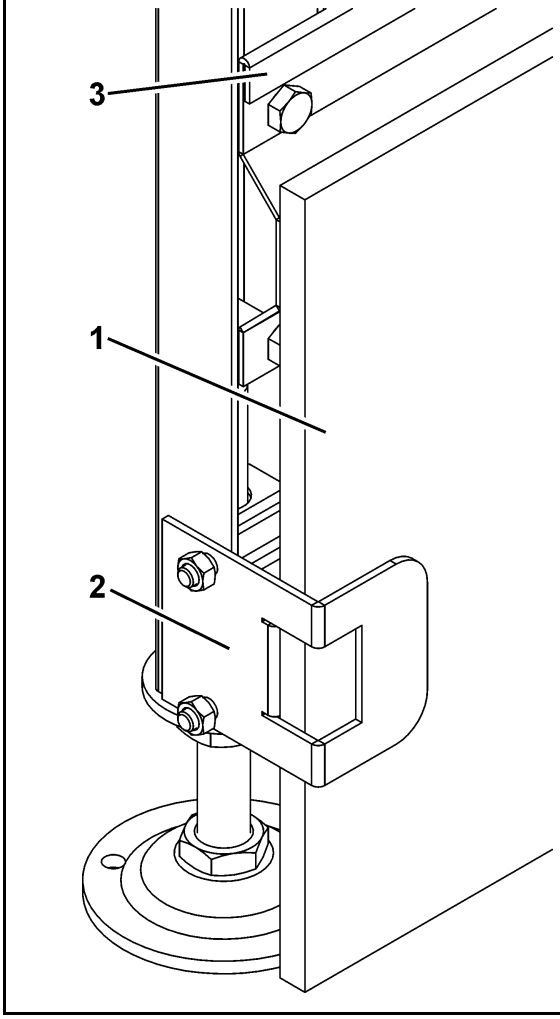
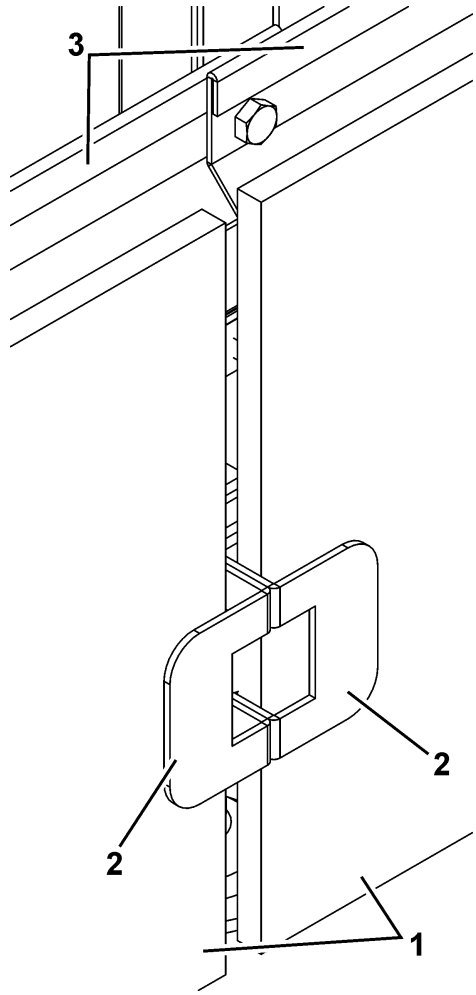
18 Assembly of the plate in the scratching area

For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

Mount a plywood panel along the entire length of the installation.



Pos.	Qty.	Code no.	Description
1	1	83-03-9738	panel 8-220x2400 laminated plywood
2	2	83-03-9698	supporting angle for plate NAT-60

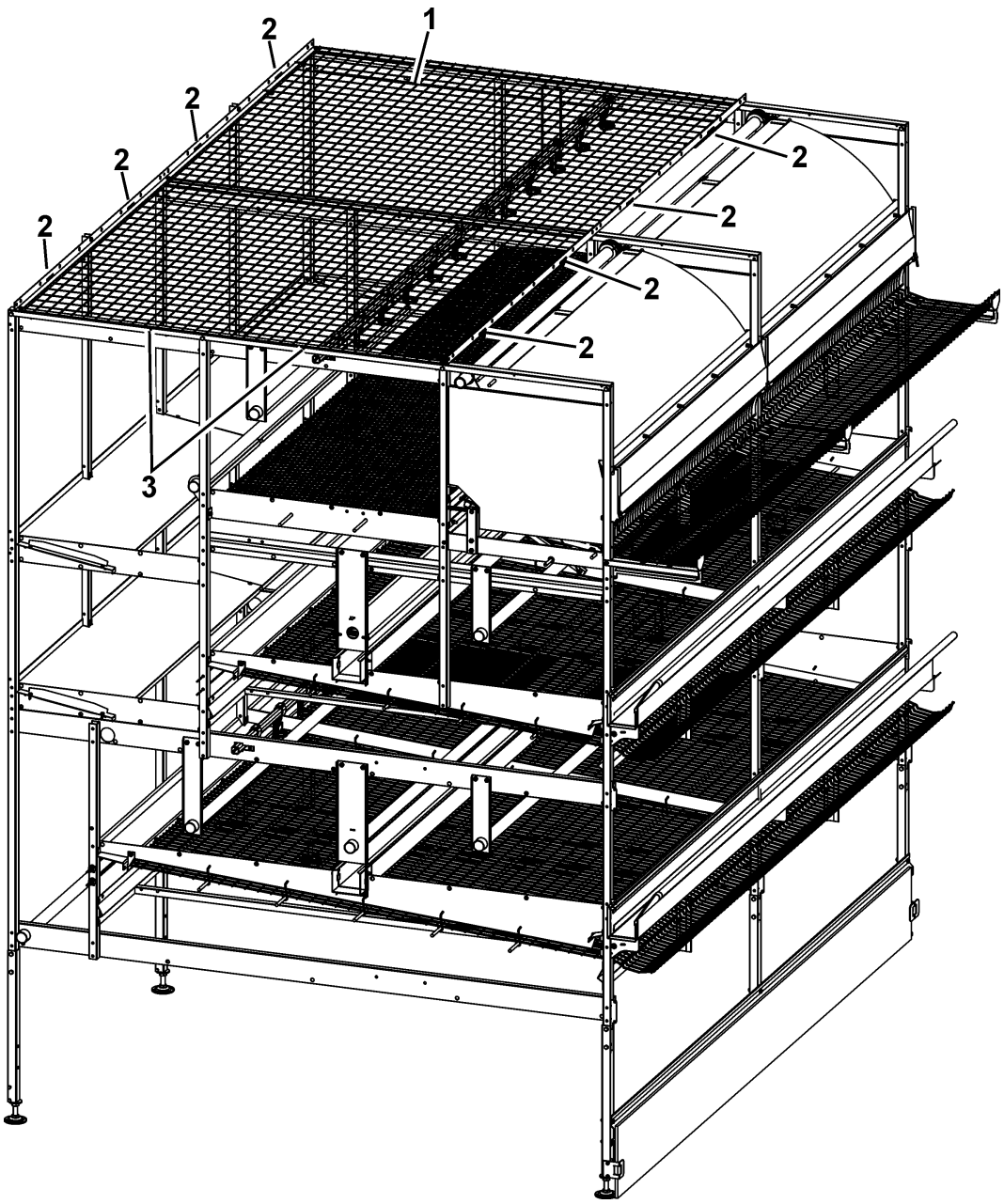
panels installed at the beginning / end of a row	**panels installed in the centre of a row**
	

Pos.	Qty.	Code no.	Description
1	1	83-03-9738	panel 8-220x2400 laminated plywood
2		83-03-9698	supporting angle for plate NAT-60
3	1	83-04-1191	side rail 2412 scratching area NAT-60

19 Assembly of the top wire mesh

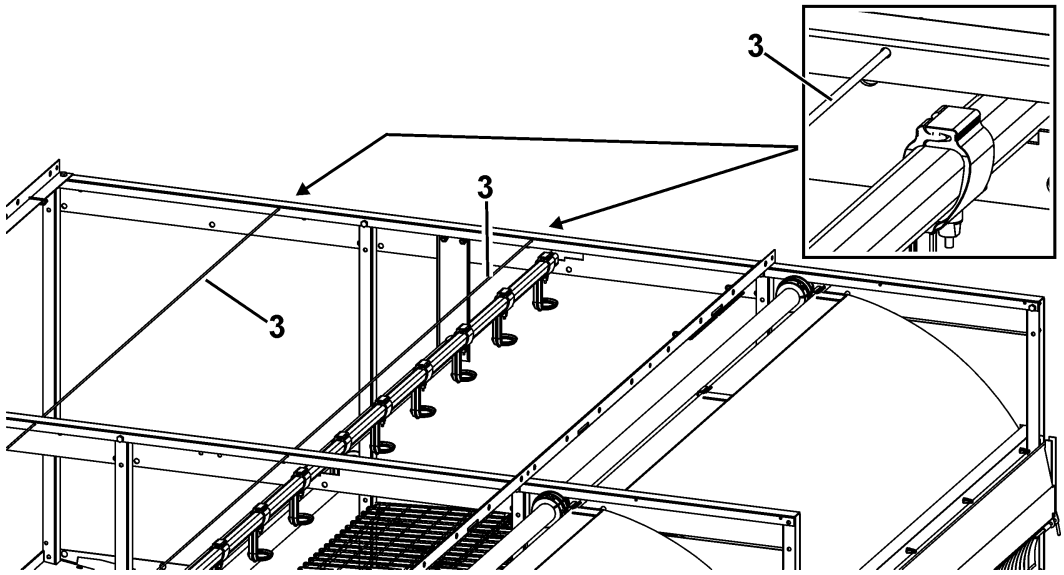
For a better view, the previously assembled component parts will no longer be displayed in the following illustrations.

Install a roof wire along the entire length of the installation.

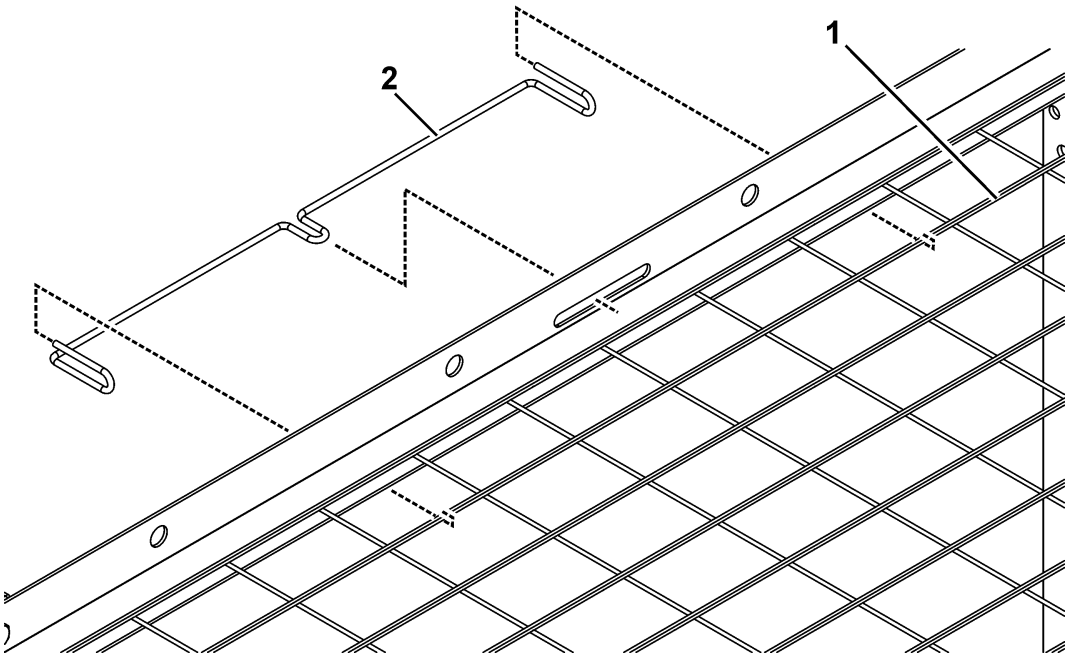


Pos.	Qty.	Code no.	Description
1		38-99-3118	top wire mesh 1,5x2xD1,65-1182 (ZnAl) CB150
2	8	37-90-3647	clip for top wire mesh
3		39-00-3343	wire 3mm galv 520m = 29kg = 1roll
4	4	38-90-3809	strap 200mm x 4.5 natural/white

A 3mm wire is inserted along the entire system length at two positions.



8 clips for top wire mesh have to be installed per section.

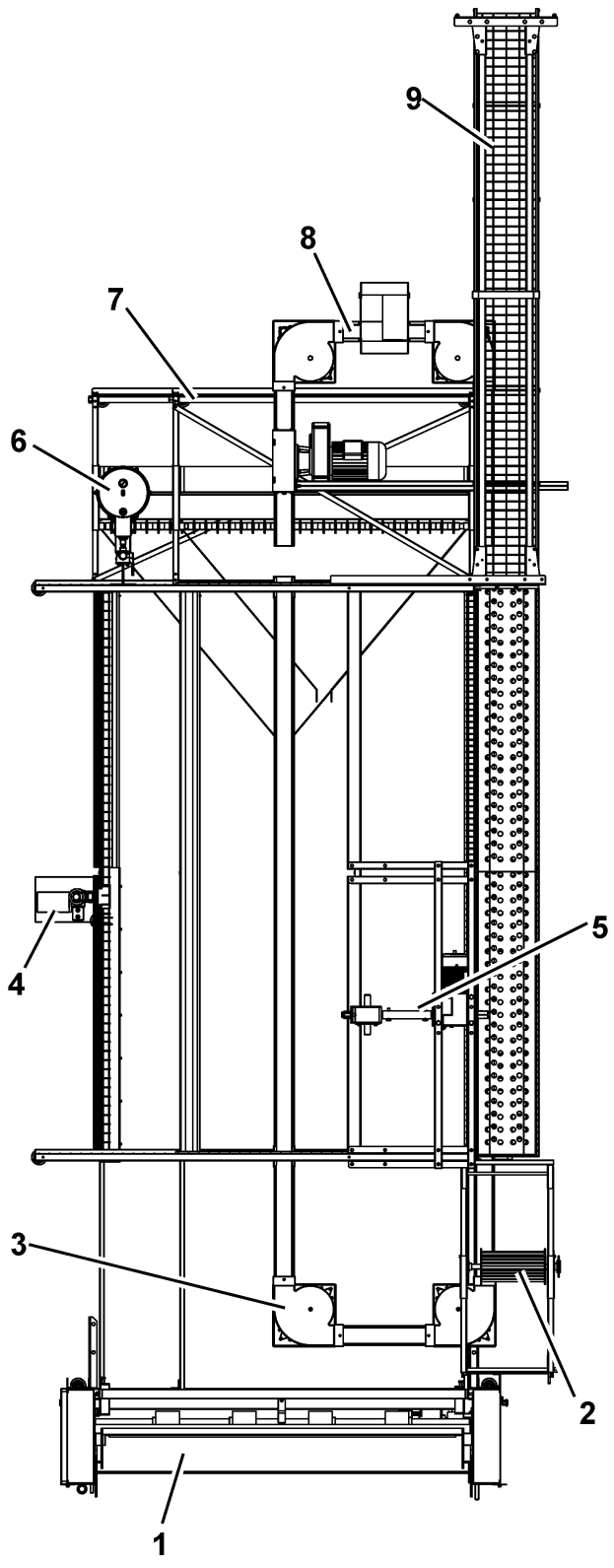


The top wire is fastened at every 3 mm wire by means of 4 straps (2 per wire) **per section.**

Pos.	Qty.	Code no.	Description
1		38-99-3118	top wire mesh 1,5x2xD1,65-1182 (ZnAl) CB150
2	8	37-90-3647	clip for top wire mesh
3		39-00-3343	wire 3mm galv 520m = 29kg = 1roll
4	4	38-90-3809	strap 200mm x 4.5 natural/white

20 Assembly of the end-sets

20.1 Total view of end-sets



1= manure belt drive

2= longitudinal belt return

3= idler feed chain

4= drive for collapsible grilles

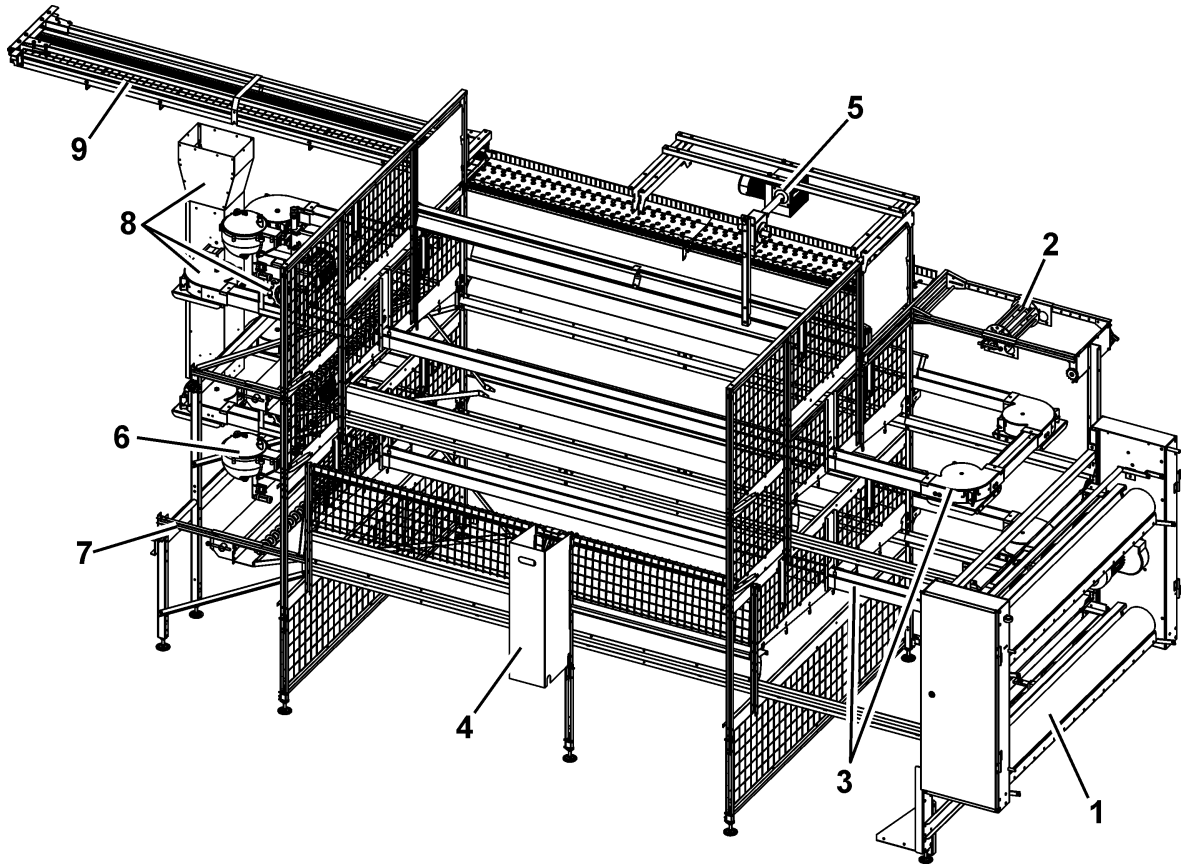
5= drive for nest eject. mechanism.

6= water container

7= idler roller for manure belt

8= feedchain drive unit and feed column

9= connection drive unit for londitudinal belt



1= manure belt drive	**2=** longitudinal belt return
3= idler feed chain	**4=** drive for collapsible grille
5= drive for nest eject. mechanism	**6=** water container
7= idler roller for manure belt	**8=** feedchain drive unit and feed column
9= connection drive unit for londitudinal belt	

20.2 Assembly of the manure belt drive unit

Caution

After the assembly and **before initial operation all protective covers** have to be replaced at the manure belt drive and have to be secured against unintentional opening.

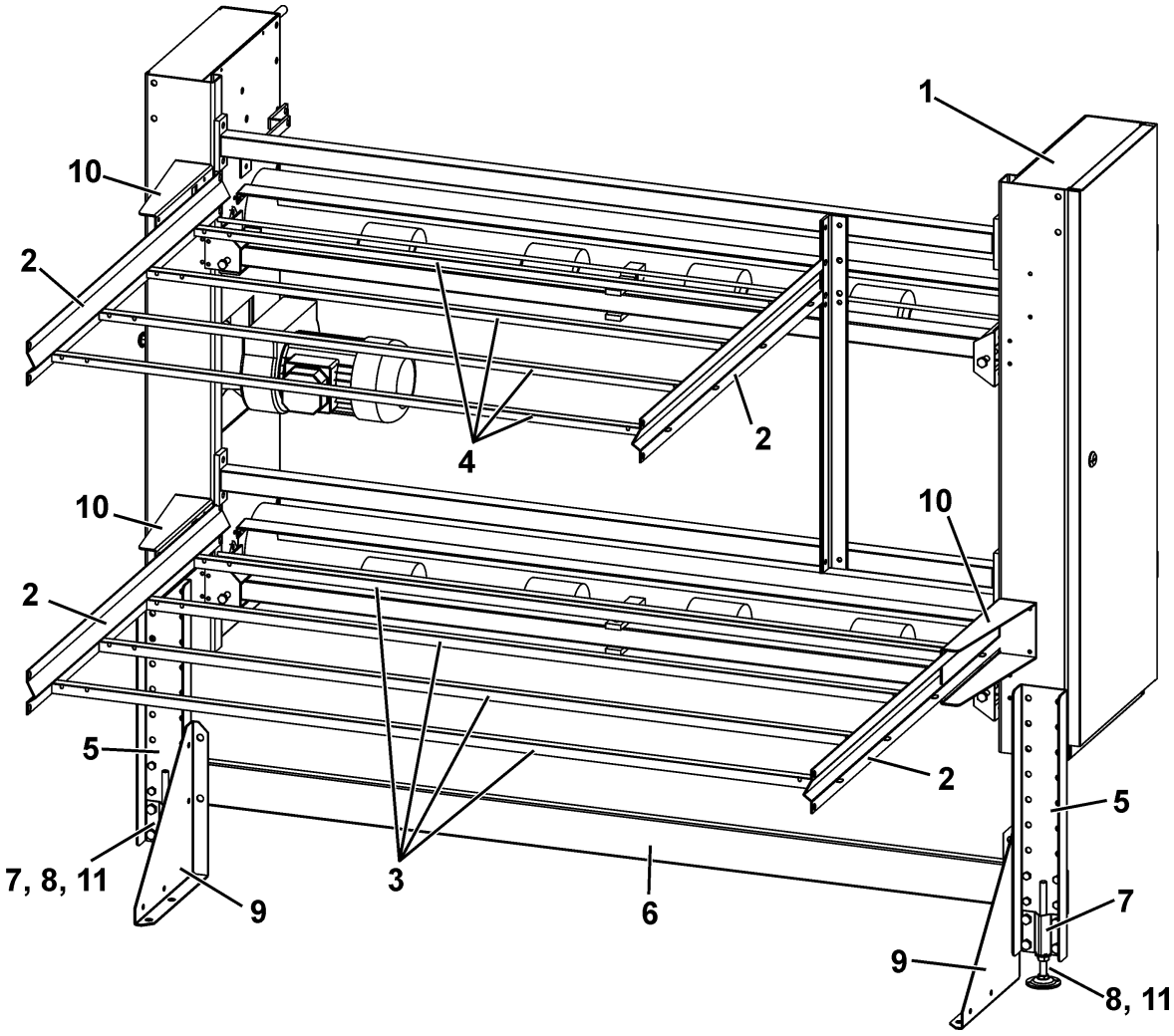
The missing of protective covers can lead to severe injuries.

Mount and align the manure belt drive in compliance with drawings and planning aids and secure it against tipping.

Pay attention to the correct overlay of the side rails in the direction of the manure belt.

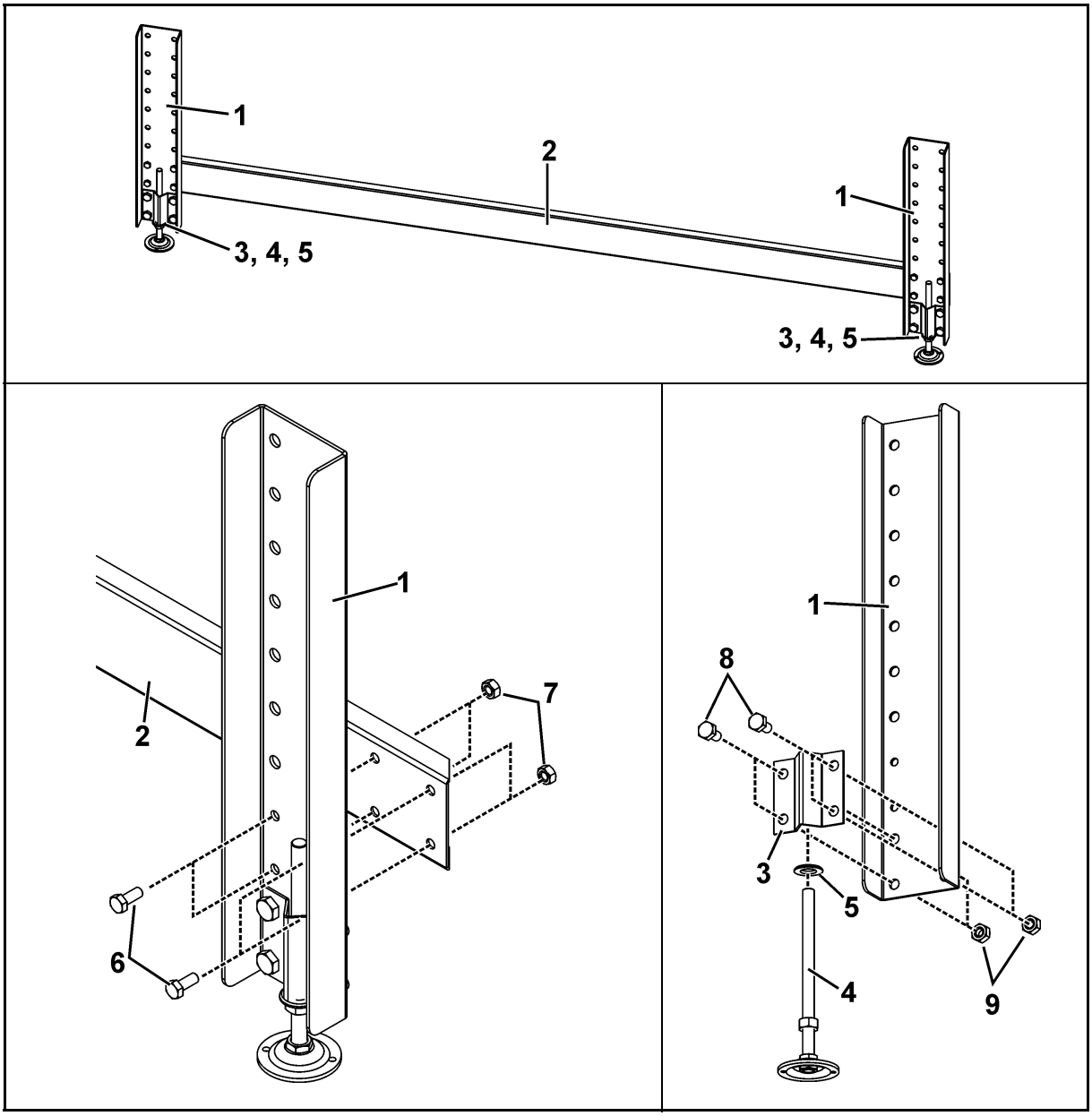
The manure belt supports are inserted into the slits of the side rails and their ends are turned over.

After inserting and welding of the manure belts, the manure chute (optionally available) has to be placed into its seat at the manure belt drive.



Pos.	Qty.	Code no.	Description
1	1	83-03-7278	drive MB 2t 1x0.75kW galv. NAT-60-1800
2	4	83-03-2535	side rail 1004 end-set NAT
3	4	83-03-6605	support for manure belt 1540 NAT-60-1800
4	4	83-03-6613	support for manure belt 1200 NAT-60
5	2	83-03-7342	extension for foot of manure belt drive NAT
6	1	83-03-7343	cross support for manure belt drive NAT / inner width XXX
7	2	83-01-5771	retainer for foot NAT-C-2000
8	2	37-97-4318	foot fully threaded M12x200 PA/SST cpl
9	2	83-01-6373	gusset plate for foot of manure belt drive NAT
10	3	83-01-5765	gusset plate for side rail end-set NAT-C-2000
11	2	99-20-1073	washer B16

20.2.1 Assembly of the substructure for the manure belt drive

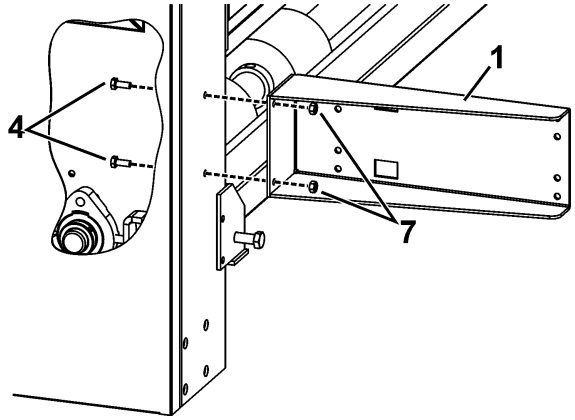


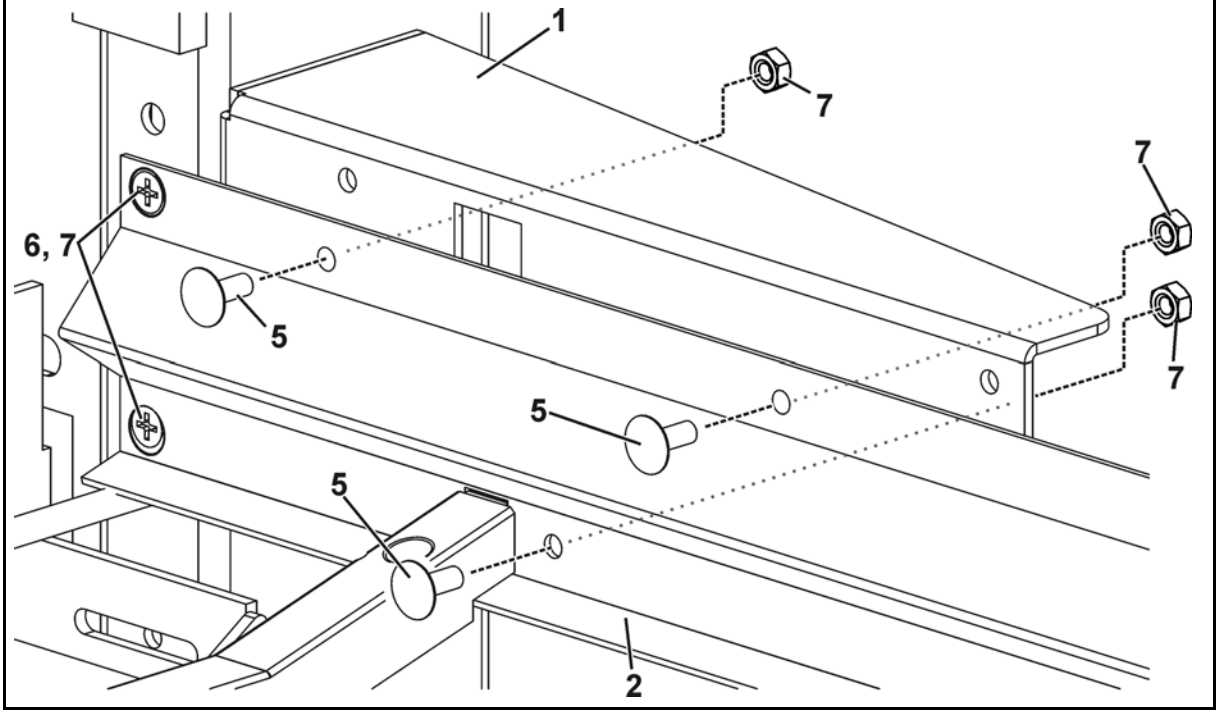
Pos.	Qty.	Code no.	Description
1	2	83-03-7342	extension for foot of manure belt drive NAT
2	1	83-03-7343	cross support for manure belt drive NAT / inner width XXX
3	2	83-01-5771	retainer for foot NAT-C-2000
4	2	37-97-4318	foot fully threaded M12x200 PA/SST cpl
5	2	99-20-1073	washer B16 DIN 125 galv.
6	8	99-10-1038	hexagon head screw M 8x20 galv. DIN 558
7	8	99-10-1040	hexagon nut M 8 galv. DIN 555
8	8	99-10-1068	hexagon head screw M 10x20 galv. DIN 558
9	8	99-20-1029	hexagon nut M 10 galv. DIN 555

20.2.2 Pre-assembly of the manure belt drive

The holes for the screw union of the side rails at the gusset plate, have to be made on-site. Use the bore holes in the side rails as template (see illustration below)!

The 4 manure belt supports are mounted in the same manner as the supports in the section.

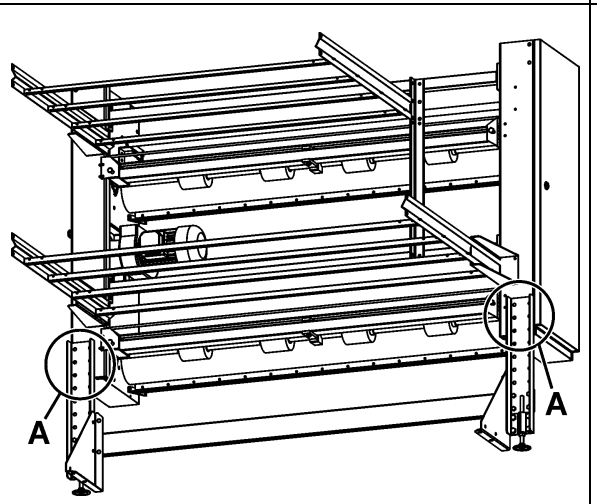
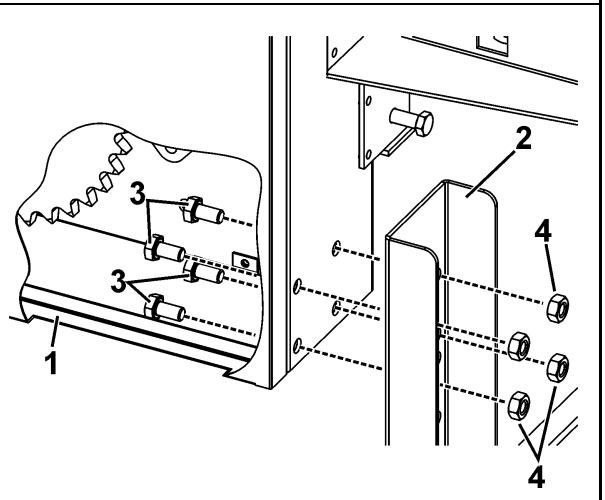




Pos.	Qty.	Code no.	Description
1	4	83-01-5765	gusset plate for side member
2	4		side rail end-set
3	8		support for manure belt
4	8	99-10-1067	hexagon head screw M 6x16 galv. DIN 933 8.8
5	16	99-10-3872	mushroom head screw M 6x16 galv. slotted
6	8	99-10-1368	countersunk screw/cross recess M 6x16 DIN 965-5.8 galv.
7	32	99-10-1045	hexagon nut M 6 galv. DIN 934-8

20.2.3 Fastening of the manure belt drive at the substructure

The correct row of holes in the "extension for foot post" that should be used for the screwing of the manure belt drive, has to be determined during the assembly on-site.

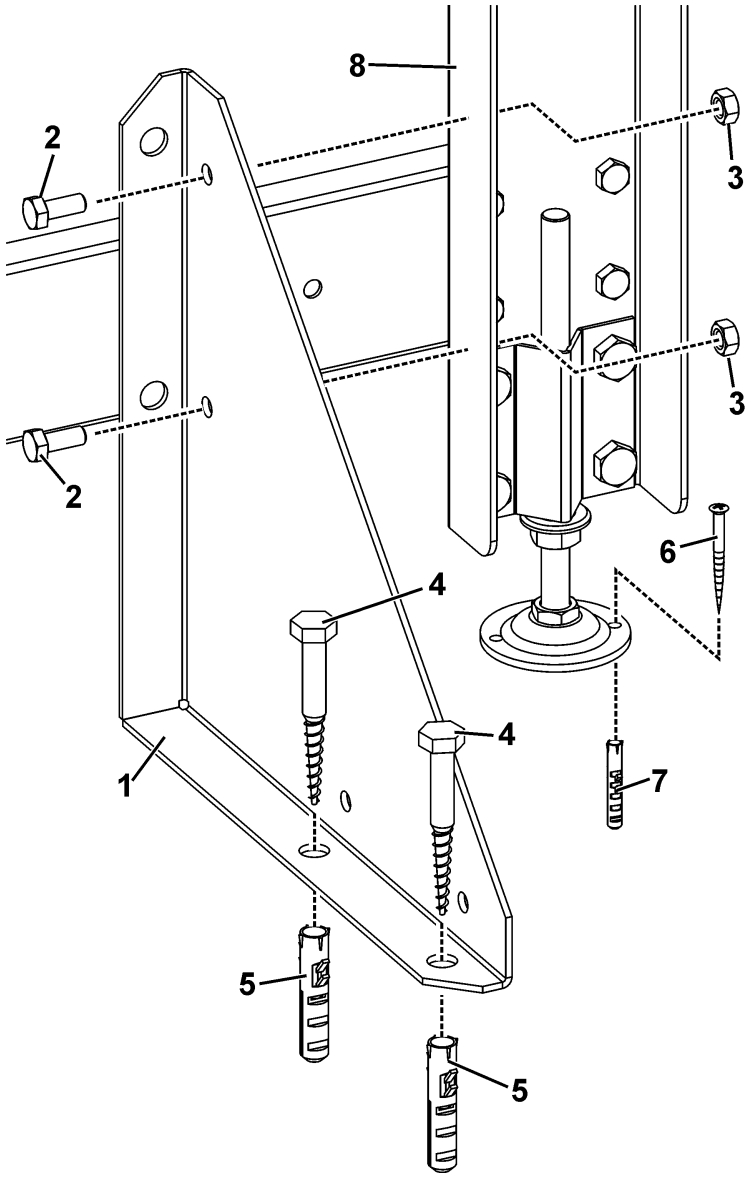
Overview screwing positions	Detail A
	

Pos.	Qty.	Code no.	Description
1	1		drive MB
2	1		extension for foot of manure belt drive NAT
3	8	99-10-1068	hexagon head screw M 10x20 galv. DIN 558
4	8	99-20-1029	hexagon nut M 10 galv. DIN 555

20.2.4 Securing of the manure belt drive

Once the entire system has been exactly aligned horizontally and vertically, the feet have to be securely fixed to the floor.

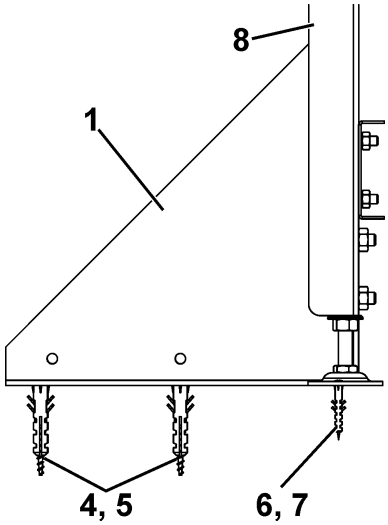
In addition, gusset plates have to be installed and also be fixed to the floor by means of screws.



detail A:

The bore holes (Ø8,5mm) intended for fixing the gusset plate at the extension have to be drilled on-site.

Side view:

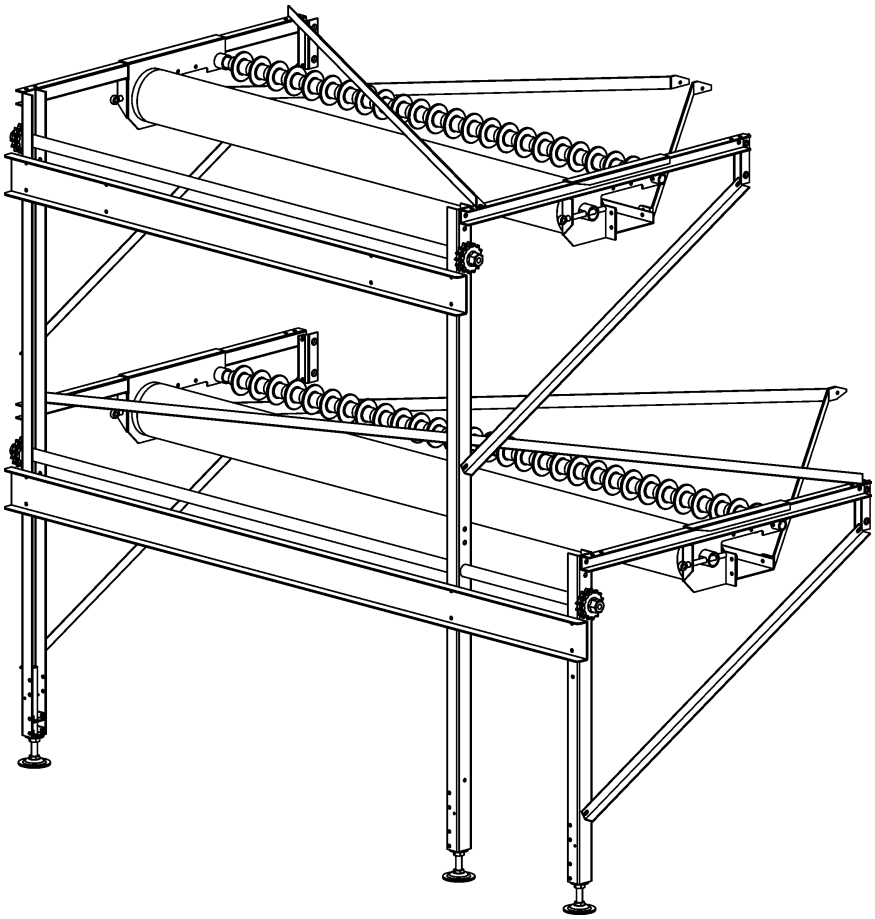


Pos.	Qty.	Code no.	Description
1	2	83-01-6373	gusset plate for foot of manure belt drive NAT
2	4	99-10-1038	hexagon head screw M 8x20 galv. DIN 933
3	4	99-10-1040	hexagon nut M 8 galv. DIN 934-8
4	4	99-10-3783	hexagon wood screw 10x 80 DIN 571-ST galv.
5	4	99-98-3783	dowel S12

Pos.	Qty.	Code no.	Description
6	2	99-10-3971	chipboard screw M4.5x50 SBC-Spax counter sunk hd galv ZnC
7	2	99-98-3782	dowel S6
8	2		extension for foot of manure belt drive NAT

20.3 Assembly end set manure belt idler

The manure belt idler unit may be mounted either in a **left hand or right hand version.** The building componets are identical for both versions.

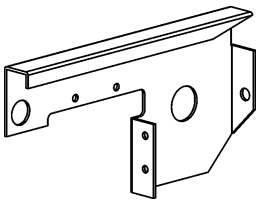
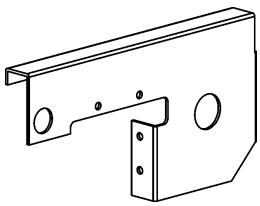
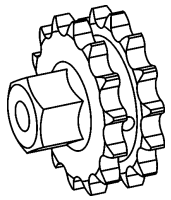
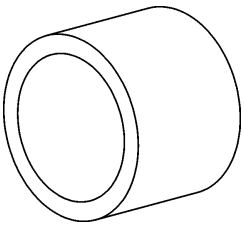
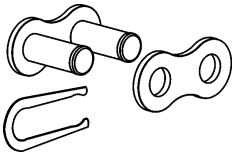
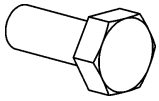
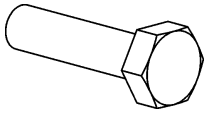
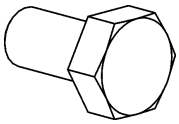
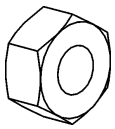
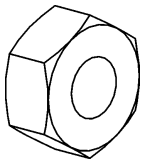
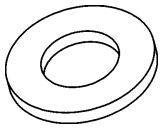
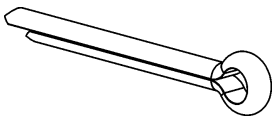
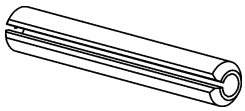
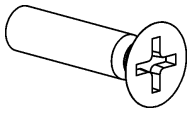
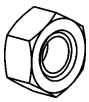
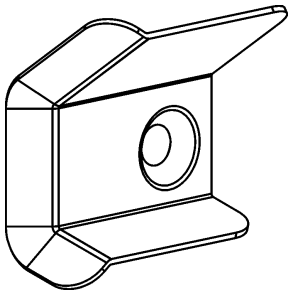
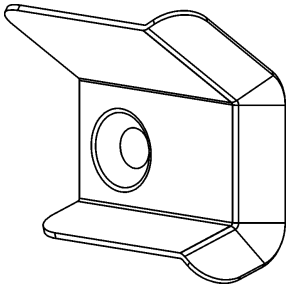
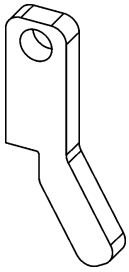
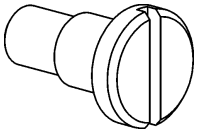


The small parts required for the assembly of the MB return are delivered **per tier** in an accessories package.

20.3.1 Accessories package for the return, supplemented with chain per tier

Pos.	Qty.	Code no.	Description
	1	**31-00-0094**	**Accessories for return, supplemented with chain per tier**
1	2	39-00-4112	eye bolt M10x120 (DIN 444) idler roller with chain
2	1	39-00-4113	guide plate lh idler roller with chain
3	1	39-00-4114	guide plate rh idler roller with chain
4	2	83-03-2175	chain wheel 1/2"-14t-b25 dbl. with nut/idler roller with chain
5	2	39-00-3246	spacer 29x23-22 PP
6	2	99-50-1241	chain joint 1/2"x5/16"
7	11	99-10-1067	hexagon head screw M 6x16 galv. DIN 933 8.8
8	2	99-10-1044	hexagon head screw M 6x25 galv. DIN 558
9	4	99-10-1046	hexagon head screw M 8x16 galv. DIN 933 8.8
10	6	99-10-1040	hexagon nut M 8 galv. DIN 934-8
11	4	99-20-1029	hexagon nut M 10 galv. DIN 555
12	2	99-20-1043	self-locking counter nut M 6 DIN 985-6 galv.
13	2	99-10-3920	washer 10.5 DIN 433 galv.
14	2	99-50-3921	splint pin 5x35 DIN 94
15	2	99-50-1351	spring type straight pin DIN 1481 - 5x40
16	4	99-10-1679	countersunk screw/cross recess M 6x25 DIN 965-5.8 galv.
17	17	99-10-1045	hexagon nut M 6 galv. DIN 934-8
18	1	83-01-2696	guide left end-set EV/UV
19	1	83-01-2697	guide right end-set EV/UV
20	2	83-03-1714	detent pawl for idler roller with chain
21	2	99-10-3919	slotted pan head screw M 8x10 DIN 923 galv.

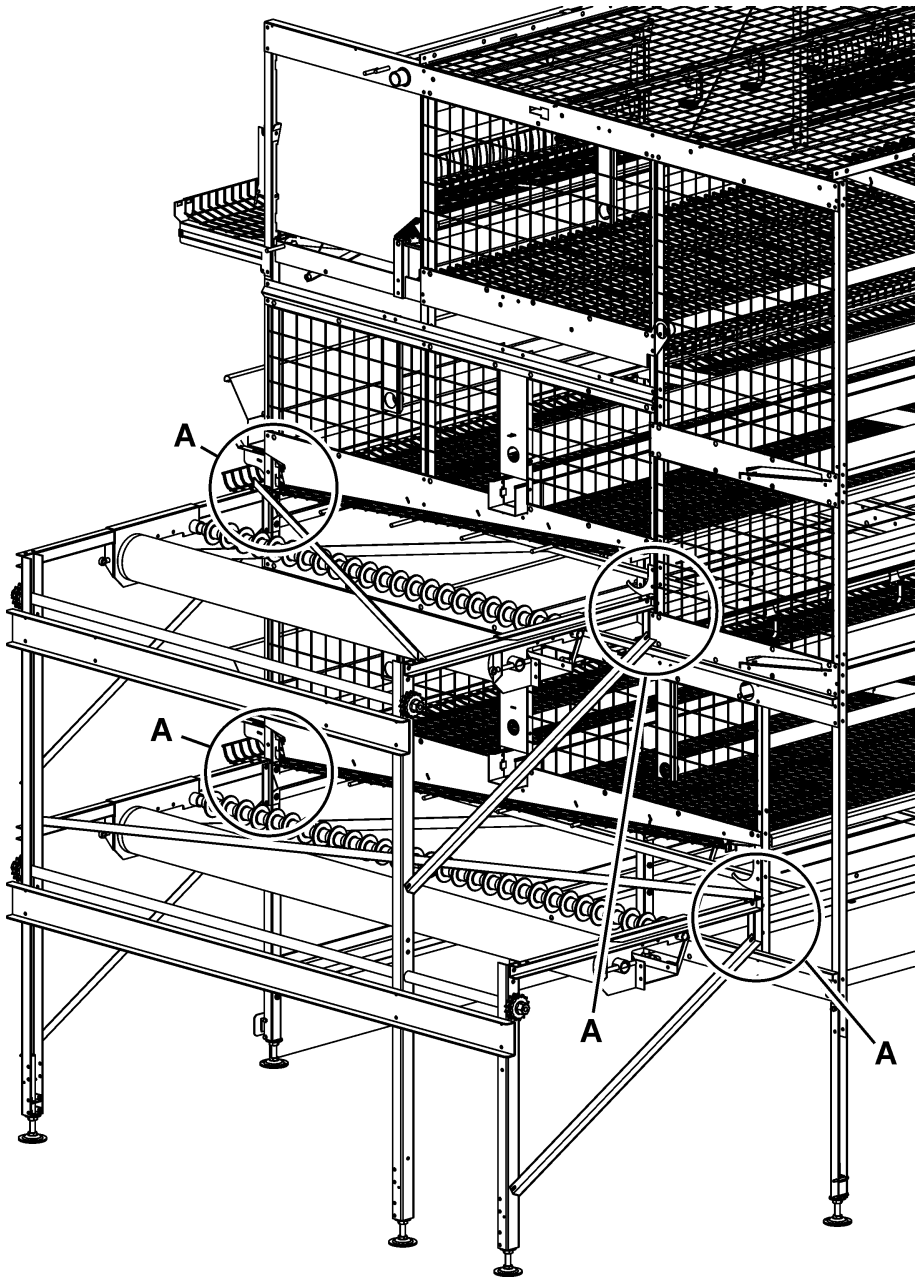
Component parts: Accessories for return, supplemented with chain per tier

1	2	3	4
			
5	**6**	**7**	**8**
			
9	**10**	**11**	**12**
			
13	**14**	**15**	**16**
			
17	**18**	**19**	**20**
			
21			
			

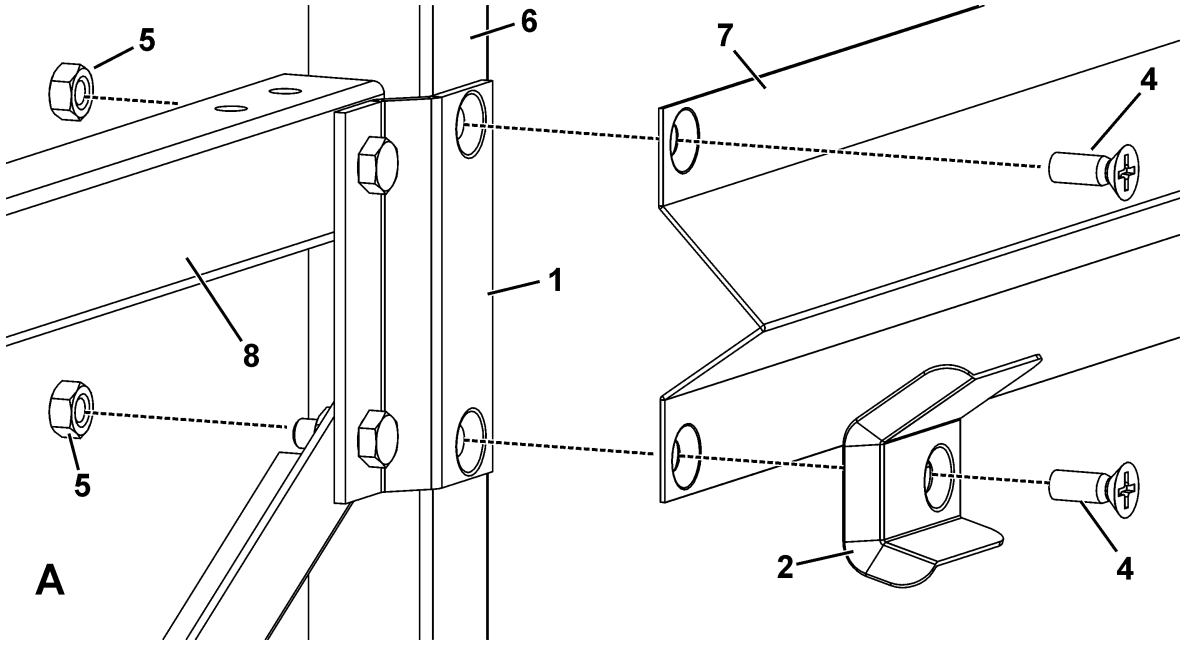
20.3.2 Connection of the MB return to the section

The MB return is connected to the section at the positions marked with an A. The connecting plate, the side rail and the manure belt guidance are screwed together to the stand posts by means of cross recessed countersunk head screws M6x25. (see detail A on the next page)

Positions of the connection: MB return / section



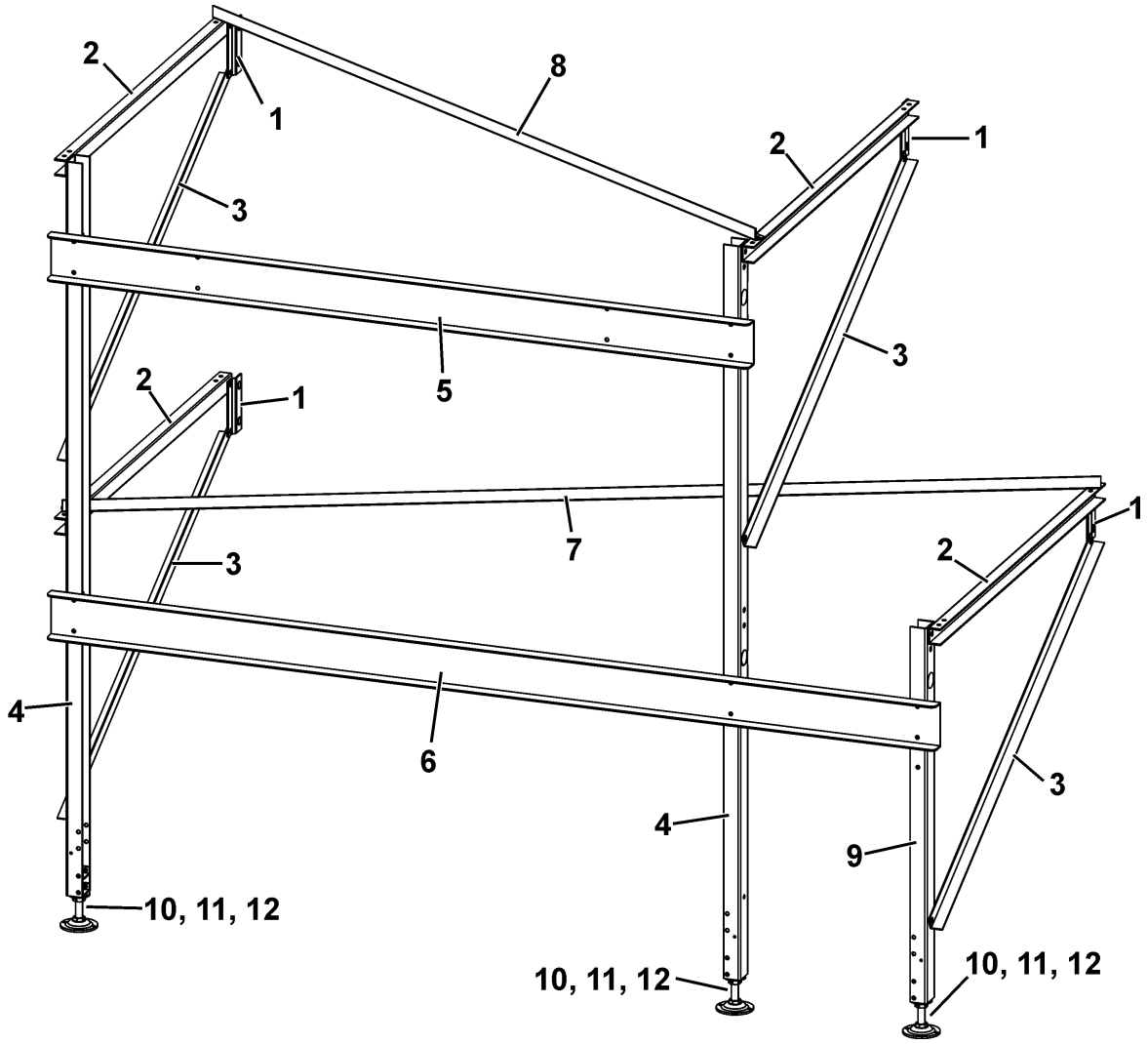
Note that the **manure belt guides are available in a left and in a right version**. (The illustration shows the left version)



Pos.	Qty.	Code no.	Description
1	4	83-03-9868	connecting plate NAT-60 MB idler chain
2	2	83-01-2696	guide left end-set EV/UV (shown)
3	2	83-01-2697	guide right end-set EV/UV
4	8	99-10-1679	countersunk screw/cross recess M 6x25 DIN 965-5.8 galv.
5	8	99-10-1045	hexagon nut M 6 galv. DIN 934-8
6			stand post
7		83-03-9725	side rail 2412 MB NAT-60
8			manure belt idler

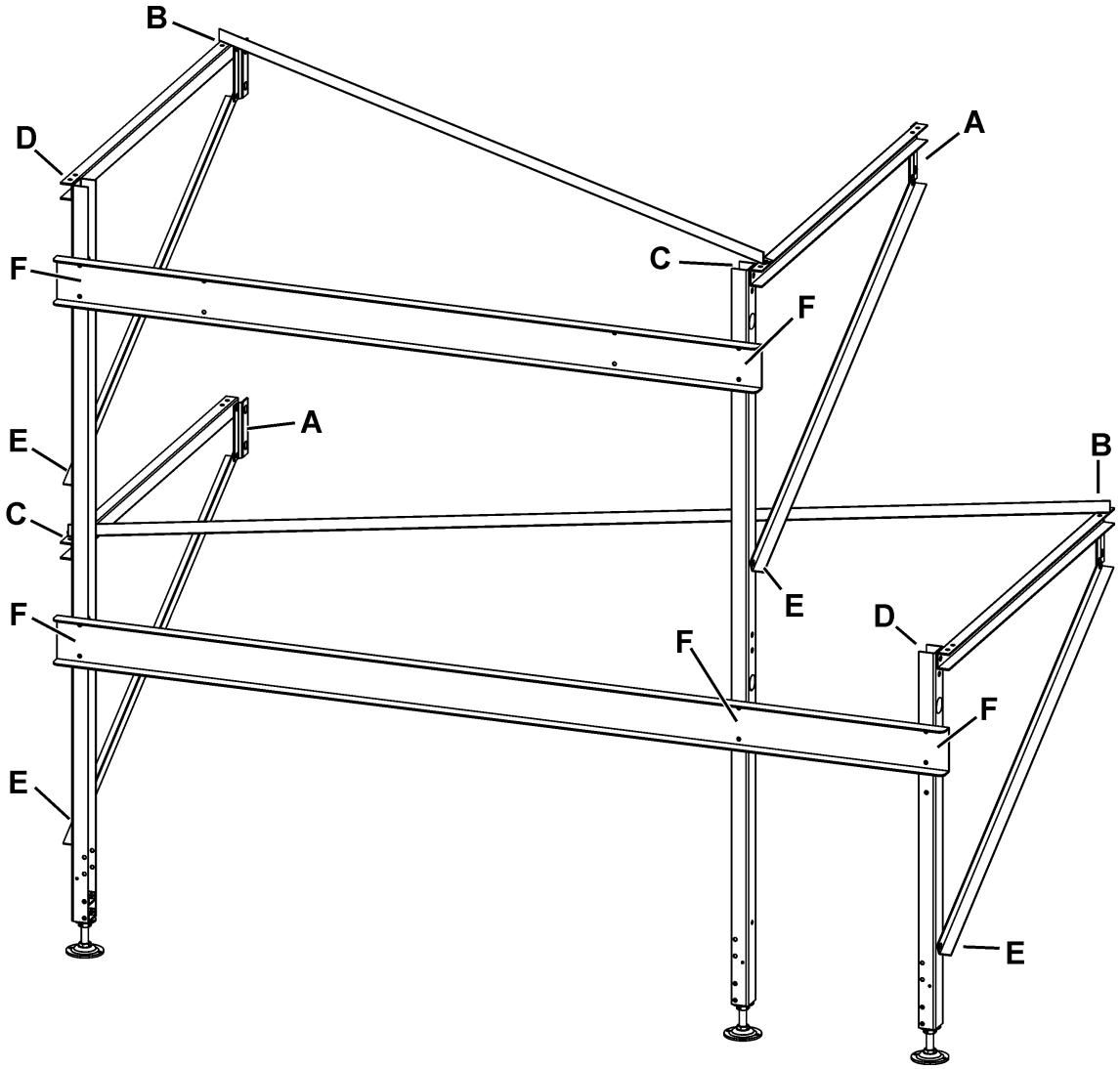
20.3.3 Assembly of the skeletal structure (left version)

20.3.3.1 Component parts



Pos.	Qty.	Code no.	Description
1	4	83-03-9868	connecting plate NAT-60 MB idler chain
2	4	39-00-4111	U-rail HD idler roller with chain
3	4	83-00-3022	cross brace NAT-nova idler roller with chain
4	2	83-03-9865	post HD 2t NAT-60 idler roller with chain
5	1	83-03-1705	cross connection HD NAT-1200 idler roller with chain
6	1	83-03-7344	cross connection HD NAT-1540 idler roller with chain
7	1	83-03-7346	diagonal strut HD NAT-1540 idler roller with chain
8	1	39-00-4074	diagonal-strut EV-S630/a MB idler roller with chain
9	1	83-03-9866	post HD 1t NAT-60 idler roller with chain
10	6	83-03-1706	holding plate galv for U-post HD MB idler
11	3	37-97-4318	foot fully threaded M12x200 PA/SST cpl
12	3	99-20-1609	washer A 13.0x37x3.0 DIN 9021 SST

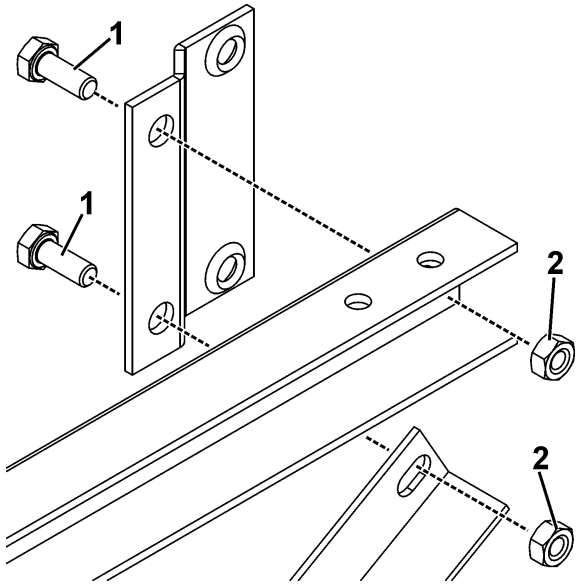
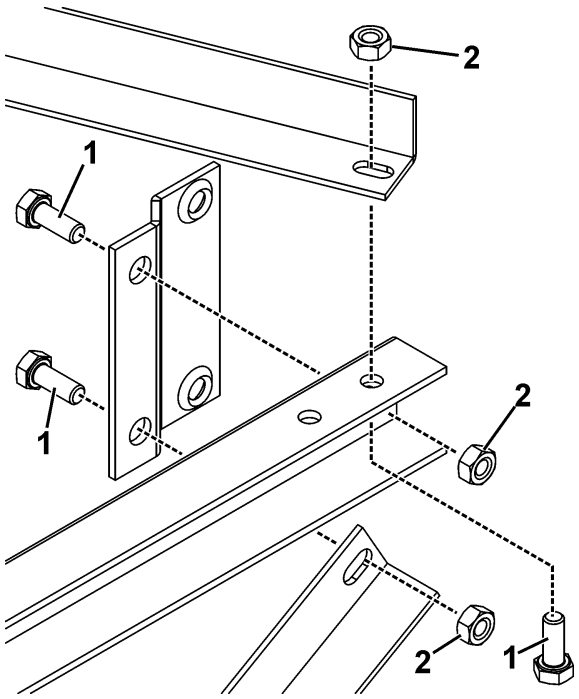
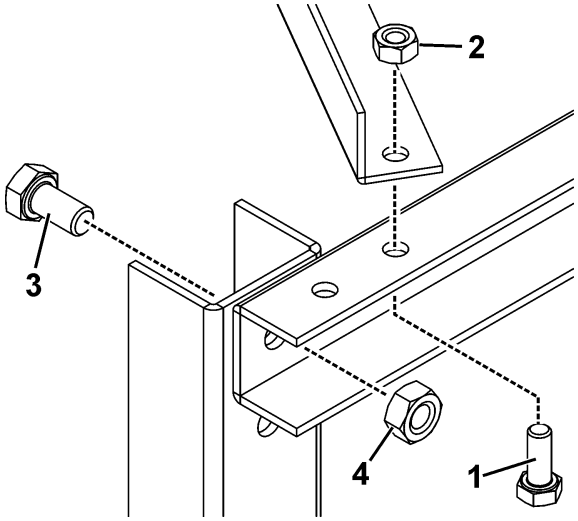
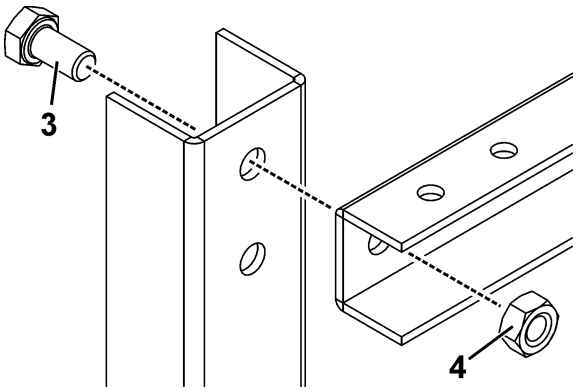
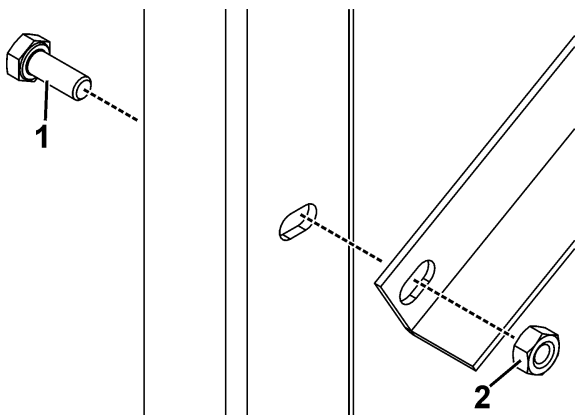
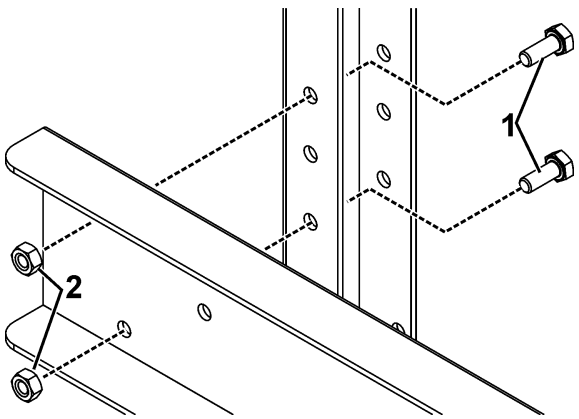
20.3.3.2 Screwing of individual parts



details A till F: see the following page

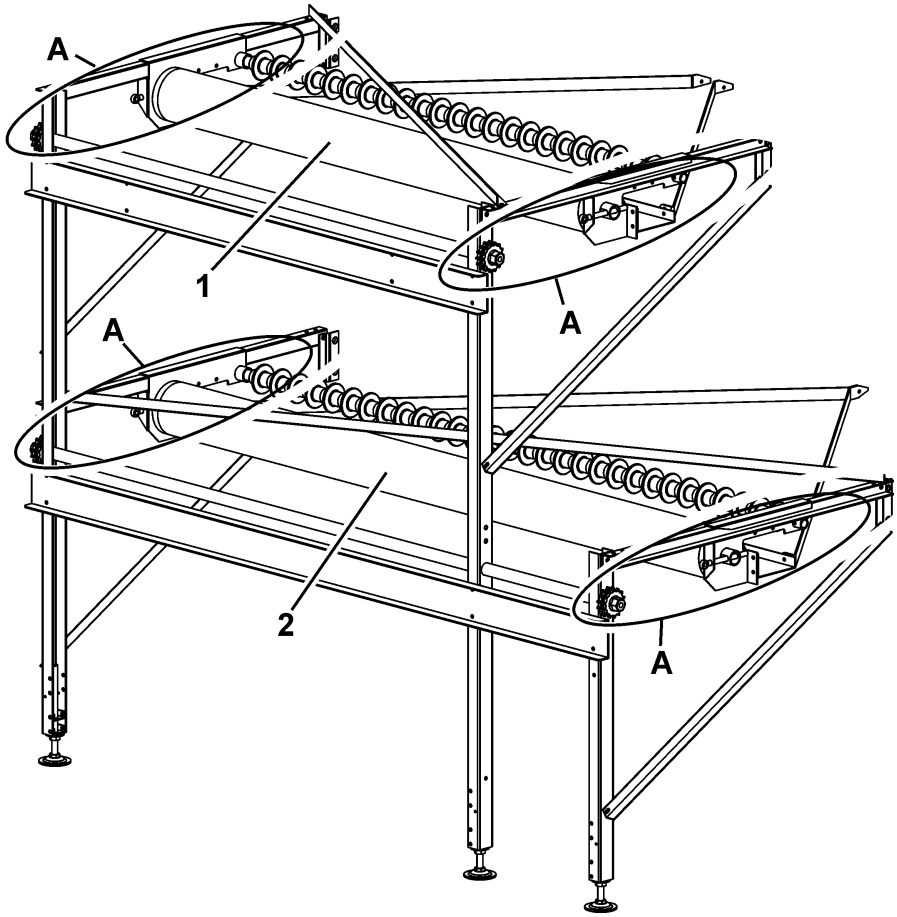
All parts are screwed together by means of:

Pos.	Qty.	Code no.	Description
1		99-10-1067	hexagon head screw M6x16 galv DIN 933 8.8
2		99-10-1045	hexagon nut M6 galv. DIN 934-8
3		99-10-1046	hexagon head screw M 8x16 galv. DIN 933 8.8
4		99-10-1040	hexagon nut M 8 galv. DIN 934-8

Detail A	Detail B
	
Detail C	**Detail D**
	
Detail E	**Detail F**
	

20.3.4 Assembly of the idler unit

20.3.4.1 General plan

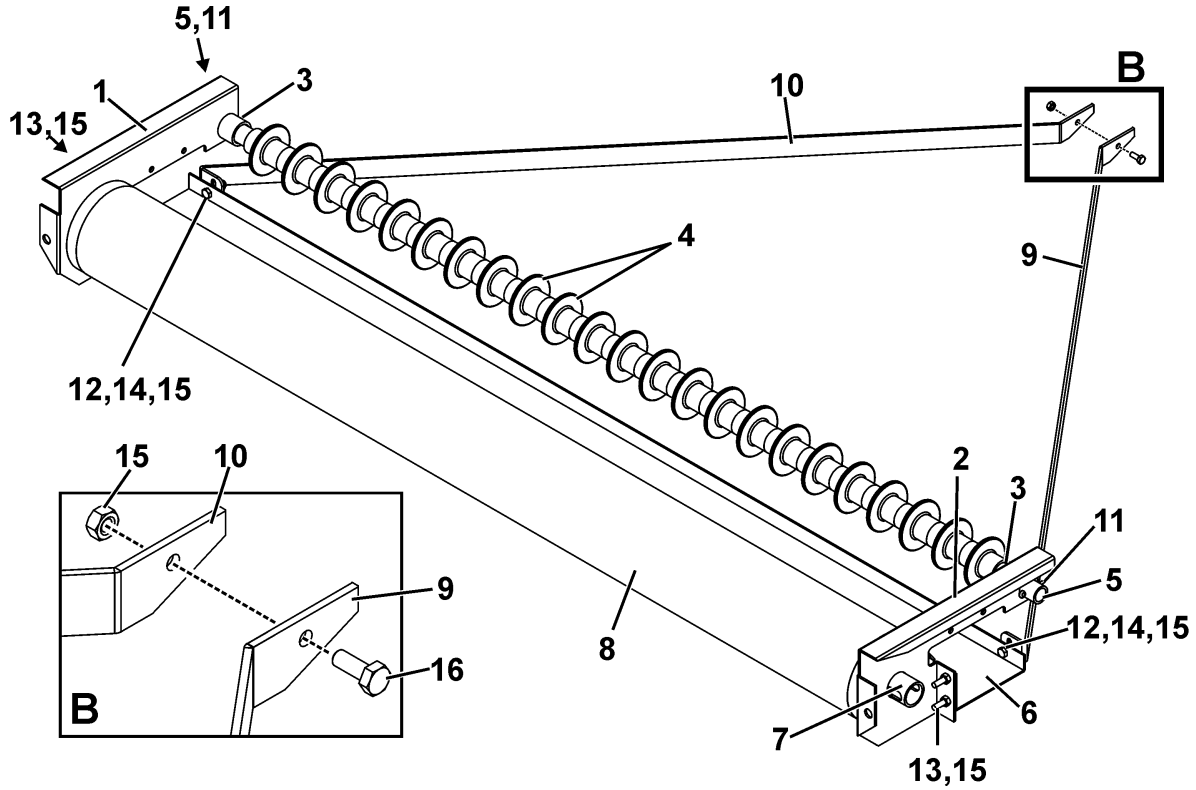


detail A: see chapter 20.3.4.3

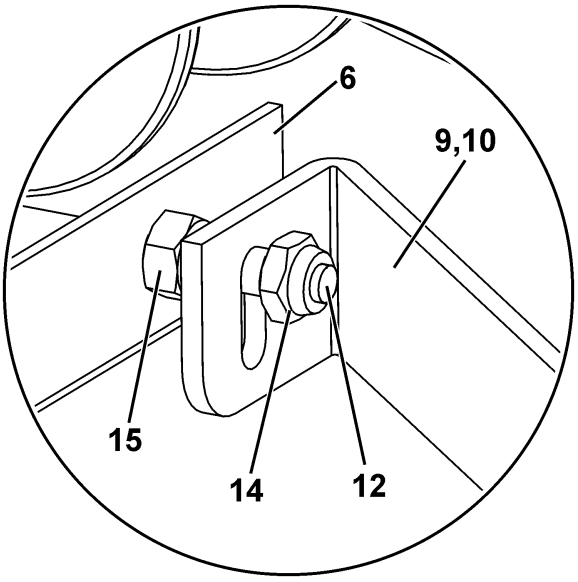
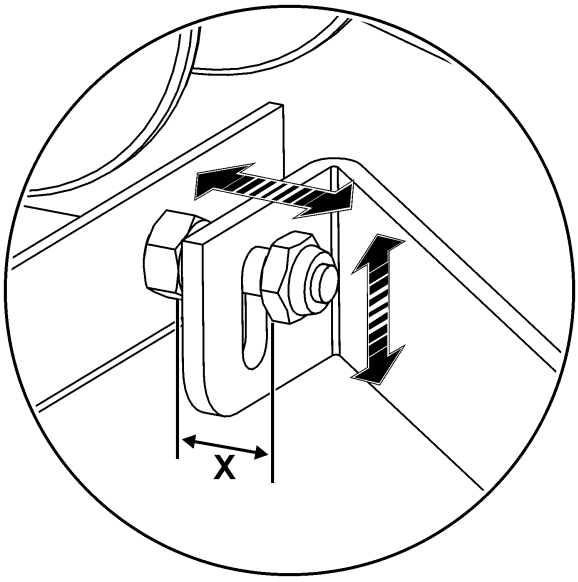
1=	idler unit for tier 1200 mm
2=	idler unit for tier 1,540mm

20.3.4.2 Assembly of the idler unit

For description of individual parts: see the following page



Note detail B in above illustration: sloping edge pointing downwards

Detail individual parts for screwing of V-scraper	The V-scrapers have to remain flexible and must therefore not be screwed too tight to the scraper. (X= approx. 10 mm)
	

Individual parts for idler unit 1200 mm:

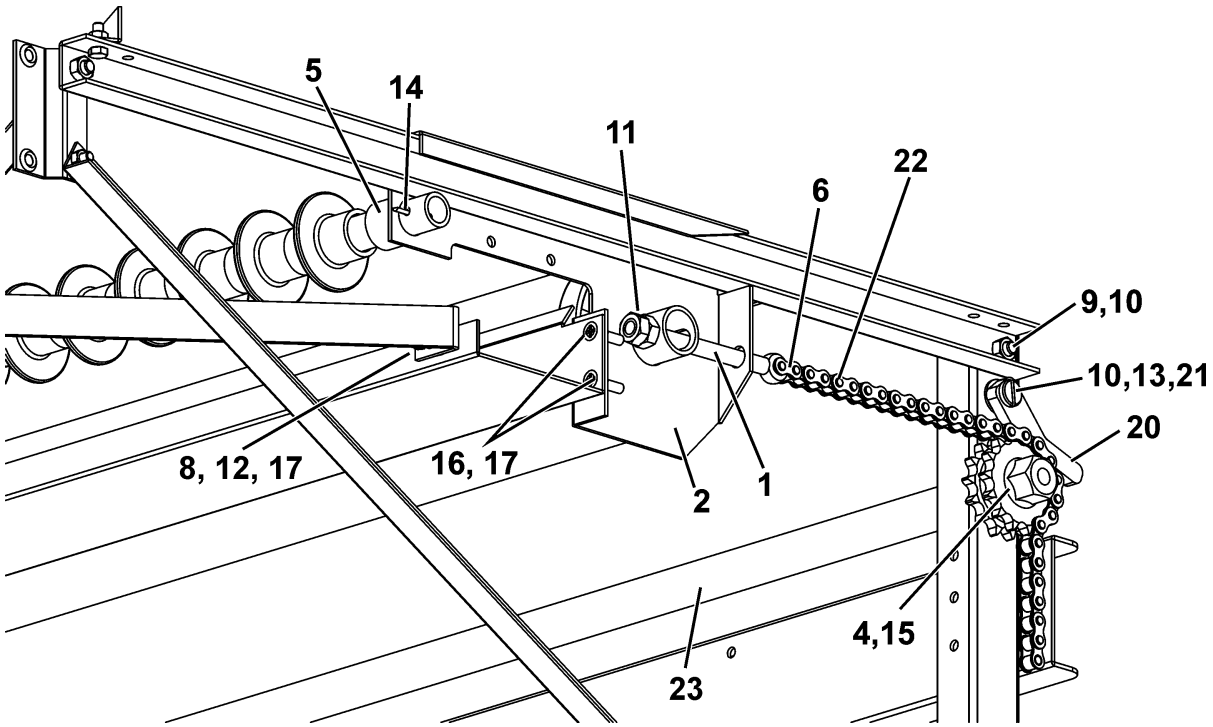
Pos.	Qty.	Code no.	Description
1	1	39-00-4113	guide plate lh idler roller with chain
2	1	39-00-4114	guide plate rh idler roller with chain
3	2	39-00-3246	spacer 29x23-22 PP
4	24	39-00-3230	roller 60x23-50 PP
5	1	39-00-4084	pipe 1/2"x1255 EV630/a MB-idler roller with chain
6	1	39-00-4104	scraper f/idler roller EV-S630/a MB idler roller with chain
7	1	39-00-4154	shaft EV-S630/a MB idler roller with chain
8	1	39-00-4124	idler roller EV-S630/a MB idler roller with chain
9	1	39-00-3171	V-scraper rh EV-S630/a
10	1	39-00-3172	V-scraper lh EV-S630/a
11	2	99-50-3921	splint pin 5x35 DIN 94
12	2	99-10-1044	hexagon head screw M 6x25 galv. DIN 558
13	4	99-10-1679	countersunk screw/cross recess M 6x25 DIN 965-5.8 galv.
14	2	99-20-1043	self-locking counter nut M 6 DIN 985-6 galv.
15	6	99-10-1045	hexagon nut M 6 galv. DIN 934-8
16	1	99-10-1067	hexagon head screw M6x16 galv DIN 933 8.8

Individual parts for idler unit 1540mm:

Pos.	Qty.	Code no.	Description
1	1	39-00-4113	guide plate lh idler roller with chain
2	1	39-00-4114	guide plate rh idler roller with chain
3	2	39-00-3246	spacer 29x23-22 PP
4	31	39-00-3230	roller 60x23-50 PP
5	1	83-03-7347	pipe 1/2" x1615 NAT-1540 MB idler roller with chain
6	1	83-03-7348	scraper f/idler roller NAT-1540 idler roller with chain
7	1	83-03-7349	shaft NAT-1540 MB idler chain
8	1	83-03-7350	idler roller NAT-1540 MB idler chain
9	2	83-03-7351	V-scraper NAT-1540
11	2	99-50-3921	splint pin 5x35 DIN 94
12	2	99-10-1044	hexagon head screw M 6x25 galv. DIN 558
13	4	99-10-1679	countersunk screw/cross recess M 6x25 DIN 965-5.8 galv.
14	2	99-20-1043	self-locking counter nut M 6 DIN 985-6 galv.
15	6	99-10-1045	hexagon nut M 6 galv. DIN 934-8
16	1	99-10-1067	hexagon head screw M6x16 galv DIN 933 8.8

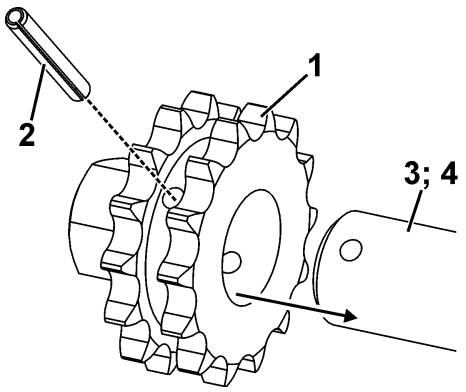
20.3.4.3 Assembly of the tension unit per tier

The following is goes for the **left and the right side of a tension unit**.



Pos.	Qty.	Code no.	Description
1	2	39-00-4112	eye bolt M10x120 (DIN 444) idler roller with chain
2	1	39-00-4113	guide plate lh idler roller with chain (shown)
or 3	1	39-00-4114	guide plate rh idler roller with chain
4	2	83-03-2175	chain wheel 1/2"-14t-b25 dbl. with nut/idler roller with chain
5	2	39-00-3246	spacer 29x23-22 PP
6	2	99-50-1241	chain joint 1/2"x5/16"
8	2	99-10-1044	hexagon head screw M 6x25 galv. DIN 558
9	4	99-10-1046	hexagon head screw M 8x16 galv. DIN 933 8.8
10	6	99-10-1040	hexagon nut M 8 galv. DIN 934-8
11	4	99-20-1029	hexagon nut M 10 galv. DIN 555
12	2	99-20-1043	self-locking counter nut M 6 DIN 985-6 galv.
13	2	99-10-3920	washer 10.5 DIN 433 galv.
14	2	99-50-3921	splint pin 5x35 DIN 94
15	2	99-50-1351	spring type straight pin DIN 1481 - 5x40
16	4	99-10-1679	countersunk screw/cross recess M 6x25 DIN 965-5.8 galv.
17	17	99-10-1045	hexagon nut M 6 galv. DIN 934-8
20	2	83-03-1714	detent pawl for idler roller with chain
21	2	99-10-3919	slotted pan head screw M 8x10 DIN 923 galv.
22	2	39-00-4030	roller chain 1/2" 48Gl
23	1		shaft

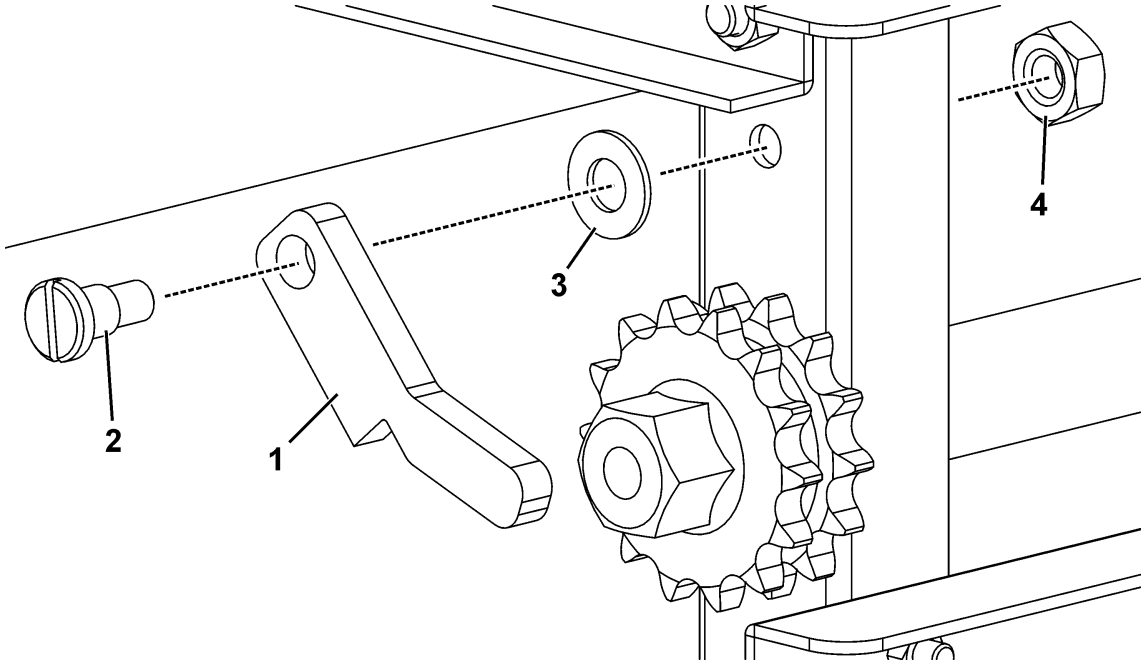
Attachment of the chain wheel to the tension shaft



The chain wheel is slid onto the tension shaft so that the bore hole in the chain wheel and the bore hole in the shaft lie flush. Fastening is done by driving in a dowel pin.

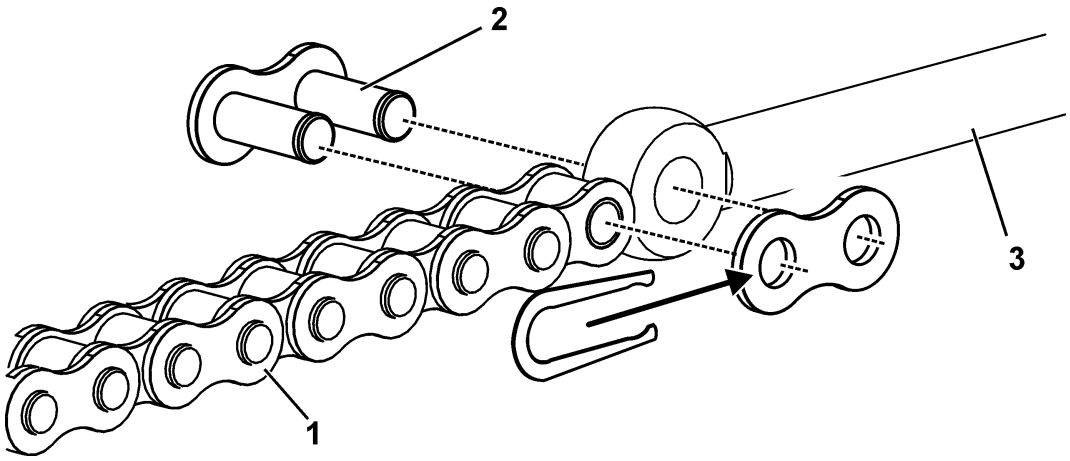
Pos.	Qty.	Code no.	Description
1	2	83-03-2175	chain wheel 1/2"-14t-b25 dbl. with nut/idler roller with chain
2	2	99-50-1351	spring type straight pin DIN 1481 - 5x40
3			shaft

Fastening of the detent pawl at the post



Pos.	Qty.	Code no.	Description
1	2	83-03-1714	detent pawl for idler roller with chain
2	2	99-10-3919	slotted pan head screw M 8x10 DIN 923 galv.
3	2	99-10-3920	washer 10.5 DIN 433 galv.
4	2	99-10-1040	hexagon nut M 8 galv. DIN 934-8

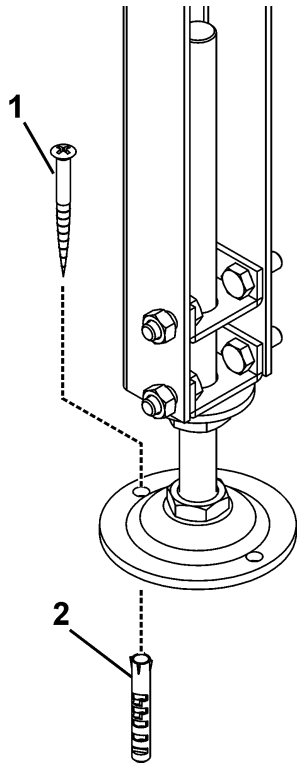
Fastening of the roller chain at the bolt



Pos.	Qty.	Code no.	Description
1	2	39-00-4030	roller chain 1/2" 48Gl
2	2	99-50-1241	chain joint 1/2"x5/16"
3	2	39-00-4112	eye bolt M10x120 (DIN 444) idler roller with chain

20.3.5 Anchorage at the floor

Once the entire system has been exactly aligned horizontally and vertically, the posts can be anchored to the floor.



After the correct alignment of the entire installation, **every foot** is screwed to the floor with:

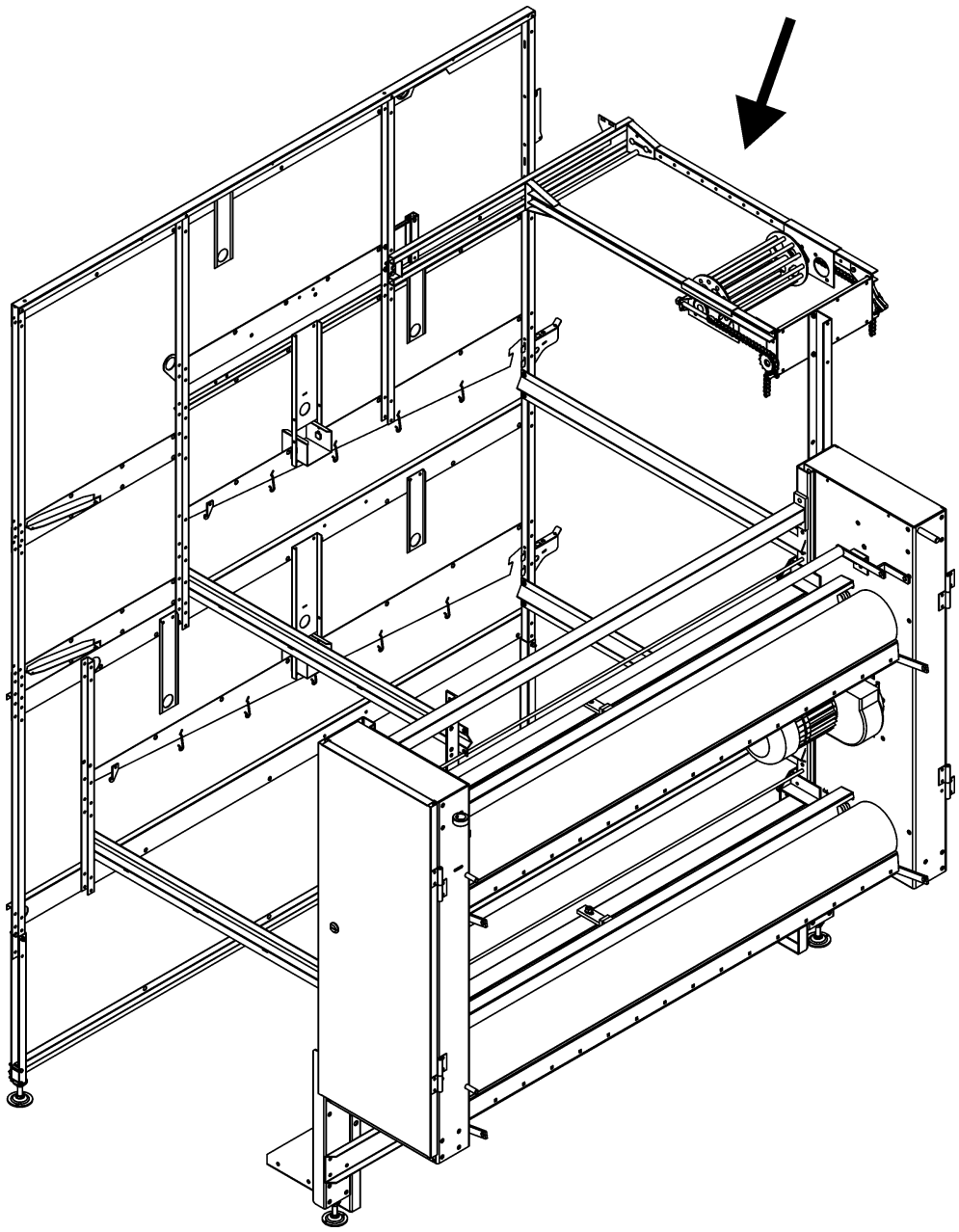
"99-10-3971 chipboard screw 4.5x 50 SBC-Spax counter sunk hd galZnC" (1)

and

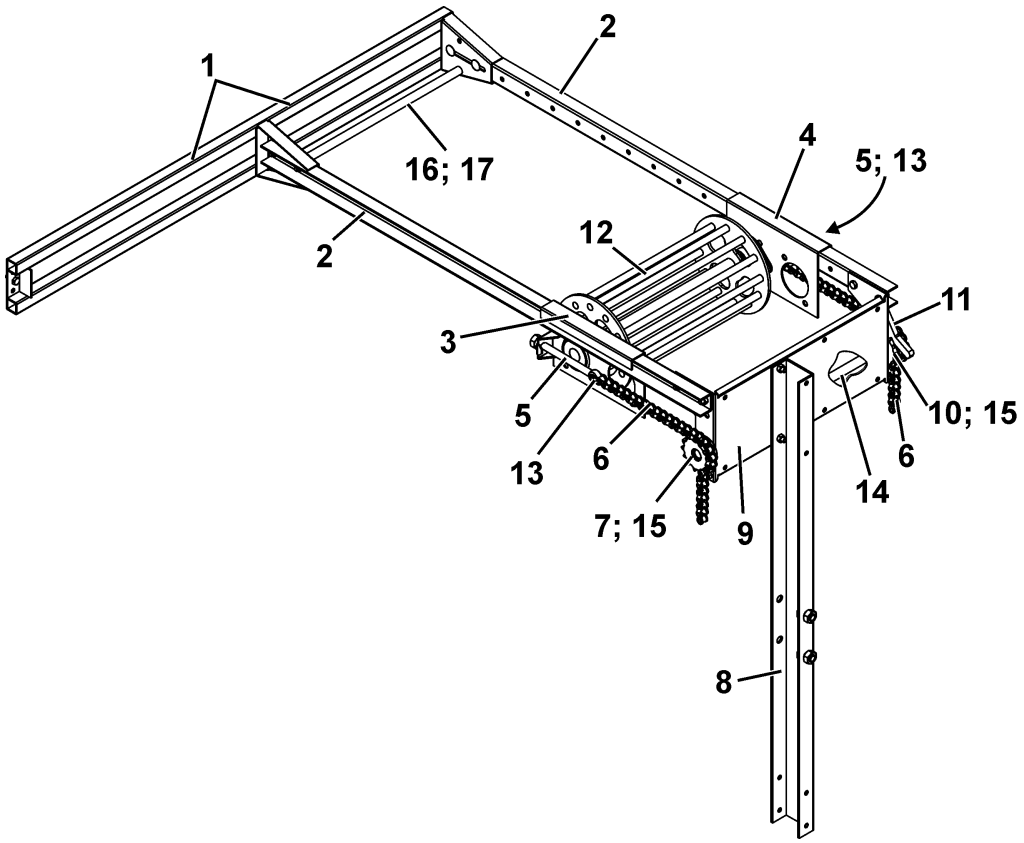
"99-98-3782 dowel S6" (2)

.

20.4 Assembly longitudinal belt return

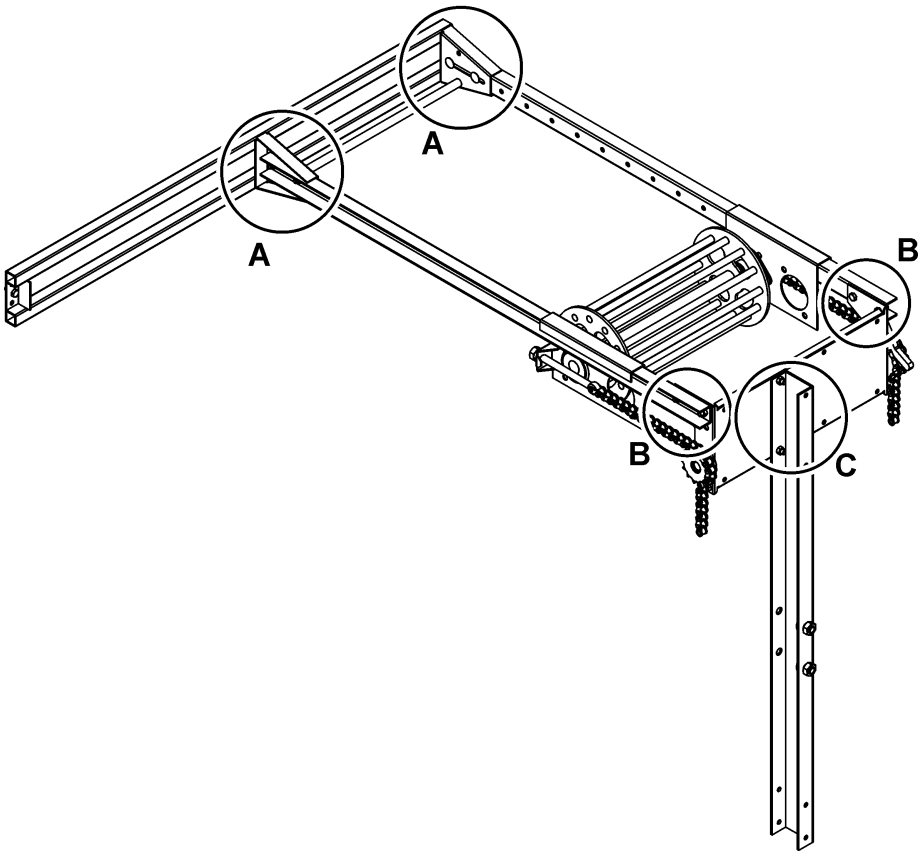


20.4.1 Component parts

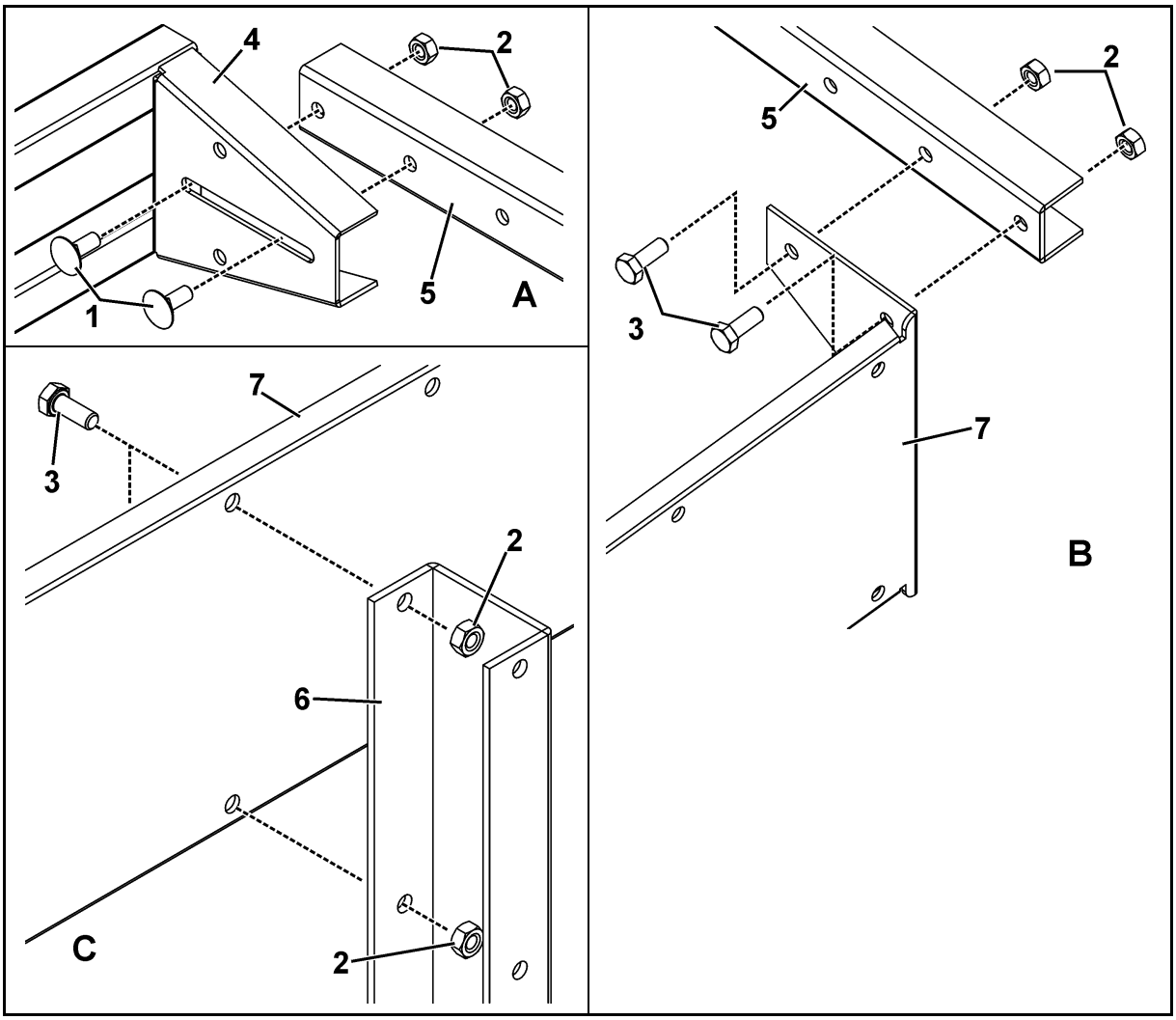


Pos.	Qty.	Code no.	Description
1	1	83-03-9951	fastening frame NAT60 Idler LB245 BD-C
2	2	83-03-9947	U-guiding rail universal for idler l-b
3	1	83-00-6103	guide plate rh for egg belt cleaner / idler 1000
4	1	83-00-6102	guide plate lh for egg belt cleaner / idler 1000
5	2	39-00-4112	eye bolt M10x120 Idler roller with chain
6	2	39-00-4030	roller chain 1/2" 48Gl
7	1	39-00-4116	chain wheel 1/2"-14t-b17,5 sgl Idler roller with chain
8	1	83-03-9953	support f/frame of tension shaft Idler LB BD-C
9	1	83-03-9952	frame f/tension shaft LB Idler LB BD-C
10	1	39-00-4115	chain wheel 1/2"-14t-b17,5 dbl w/nut -Idler roller with chain
11	1	83-03-1714	detent pawl for idler roller with chain
12	1	83-00-6098	idler roller cpl incl shaft and ball bearing for belt 245
13	2	99-50-1241	chain joint 1/2"x5/16"
14	1	83-00-6107	tube 3/8" x 382 BD-C2+ Idler of egg belt 245
15	2	99-50-1351	spring type straight pin 5x40
16	1	99-10-3706	rod threaded M 6x1000 DIN 976 galv.
17	1	37-97-4804	tube for conveyor chain 500 rod conveyor

20.4.2 Screwing of individual parts



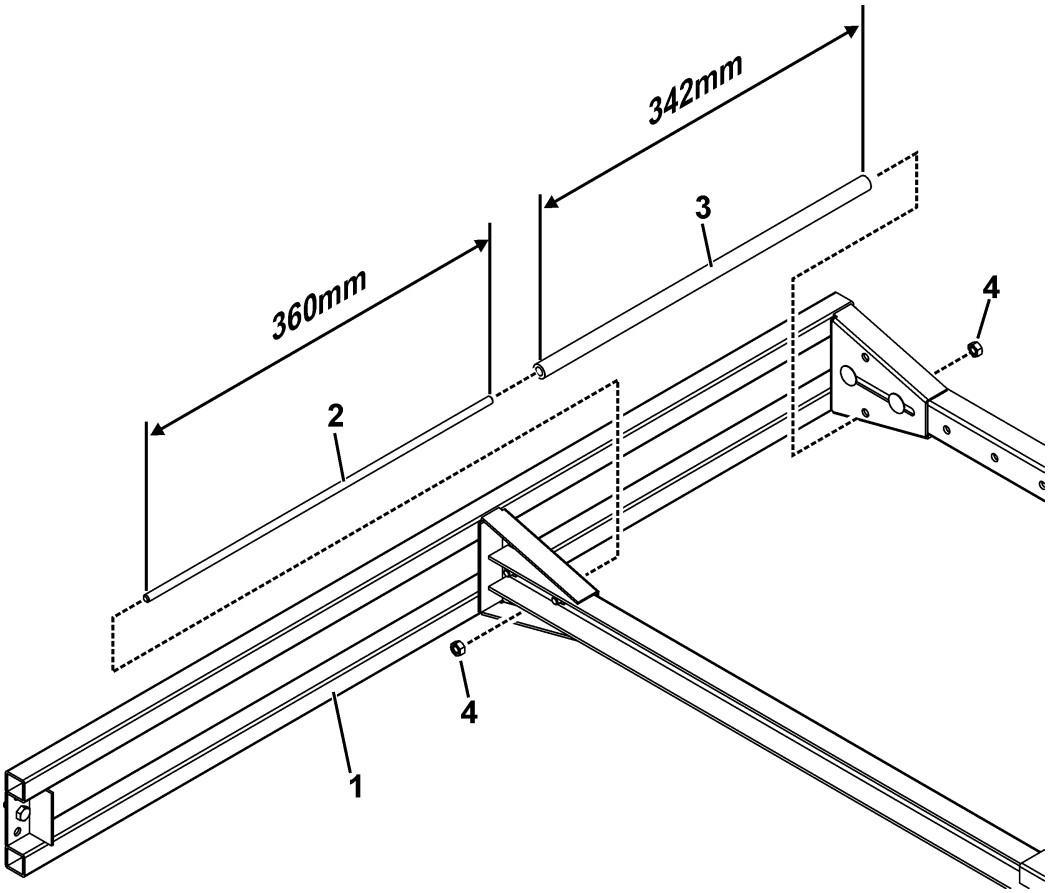
details: see the following page



Pos.	Qty.	Code no.	Description
1	4	99-10-1602	mushroom head square neck bolt M 6x 16 DIN 603 galv
2	10	99-10-1045	hexagon nut M 6 galv. DIN 934-8
3	6	99-10-1067	hexagon head screw M 6x 16 galv. DIN 933 8.8
4	1	83-03-9951	fastening frame NAT60 Idler LB245 BD-C
5	2	83-03-9947	U-guiding rail universal for idler l-b
6	1	83-03-9953	support f/frame of tension shaft Idler LB BD-C
7	1	83-03-9952	frame f/tension shaft LB Idler LB BD-C

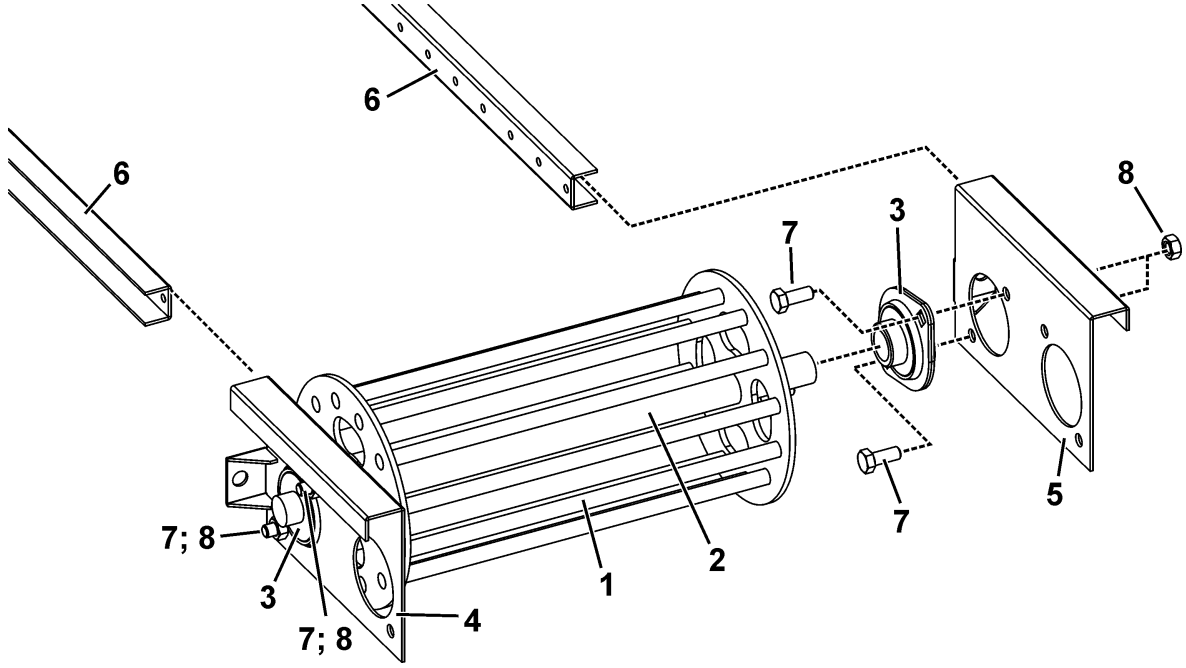
20.4.3 Assembly of Rolle for the returning eggbelt 245

	The "rod threaded" and the "tube for conveyorchain 500" will be cut to the dimensiones mentioned in the picture below on the site. The "tube for conveyorchain 500" must be free bending.



Pos.	Qty.	Code no.	Description
1	1	83-03-9951	fasteningframe NAT60 idler LB245 BD-C2+
2	1	99-10-3706	rod threaded M 6x1000 DIN 976 galv. (cut on site)
3	1	37-97-4804	tube for conveyorchain 500 rod conveyor (cut on site)
4	2	99-10-1045	hexagon nut M6 galv. DIN 934-8

20.4.4 Assembly of idler unit



Pos.	Qty.	Code no.	Description
1	1	83-00-6098	idler roller cpl incl shaft and ball bearing for belt 245
2	1		shaft
3	2		flange bearing
4	1	83-00-6103	guide plate rh for egg belt cleaner / idler 1000
5	1	83-00-6102	guide plate lh for egg belt cleaner / idler 1000
6	2	83-03-9947	U-guiding rail universal for idler LB
7	4	99-10-1038	hexagon head screw M 8x 20 galv.DIN 558
8	4	99-10-1040	hexagon nut M 8 galv. DIN 934-8

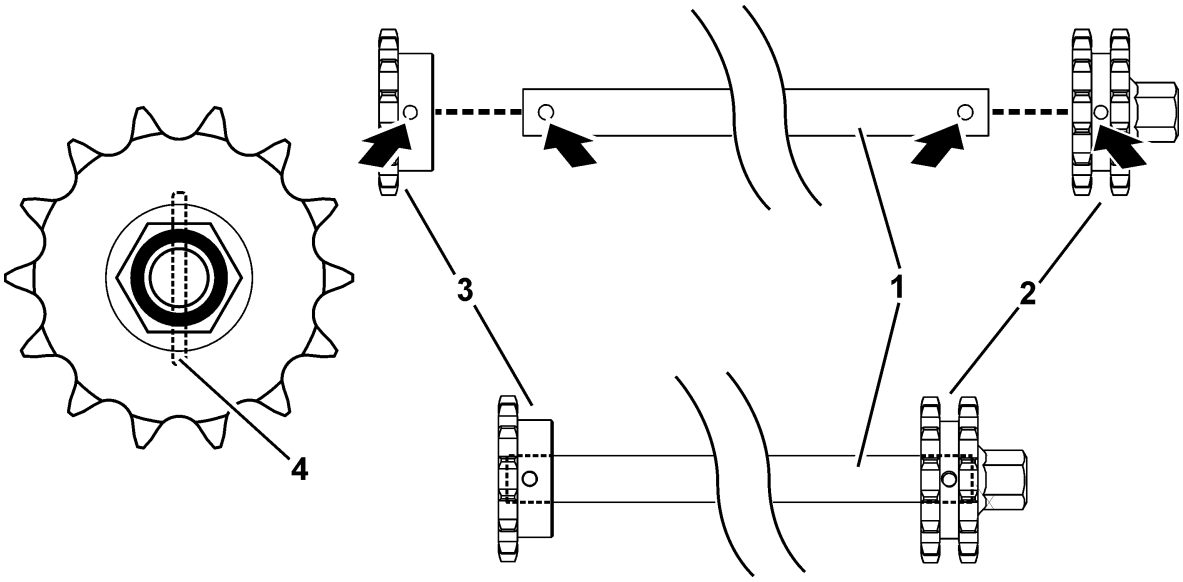
20.4.5 Installing the tension shaft and detent pawl

20.4.5.1 Note regarding fixing the chain wheels to the tension shaft

The chain wheels are inserted to the tube in such a way that the bore holes in the wheels and the bore holes in the tubes are lying upon another congruently. By driving in the spring type stright pins into these holes the chain wheels are fixed to the tube.

Important:

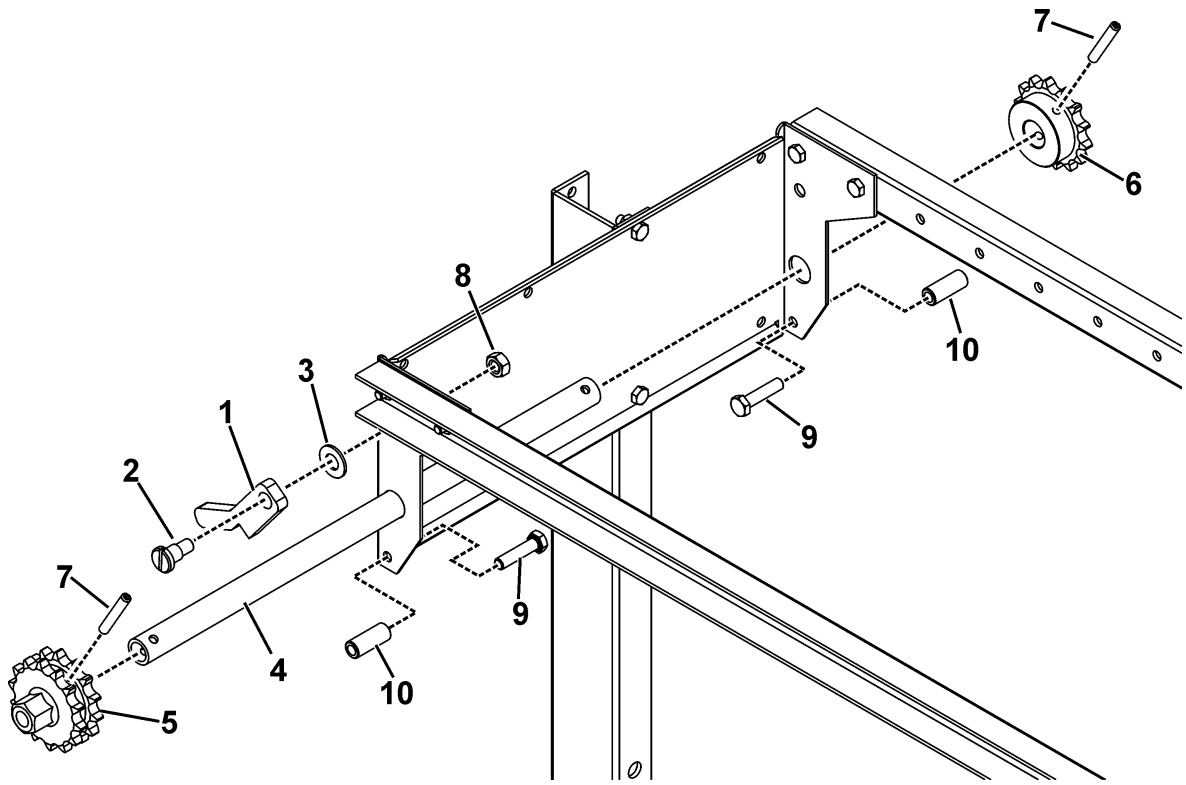
Before fixing the 2nd chain wheel to the tension shaft, the shaft has to be inserted through the corresponding bores into the tension shaft frame.



Pos.	Qty.	Code no.	Description
1	1	83-00-6107	tube 3/8" x 382 BD-C2+ idler of egg belt 245
2	1	39-00-4115	chain wheel 1/2"-14t-b17,5 dbl,w/nut -idler roller with chain
3	1	39-00-4116	chain wheel 1/2"-14t-b17,5 sgl idler roller with chain
4	2	99-50-1351	spring type straight pin 5x40 DIN 1481

20.4.5.2 Assembling the tension shaft and detent pawl with pin

The detent pawl is only installed at the side with the double chain wheel.

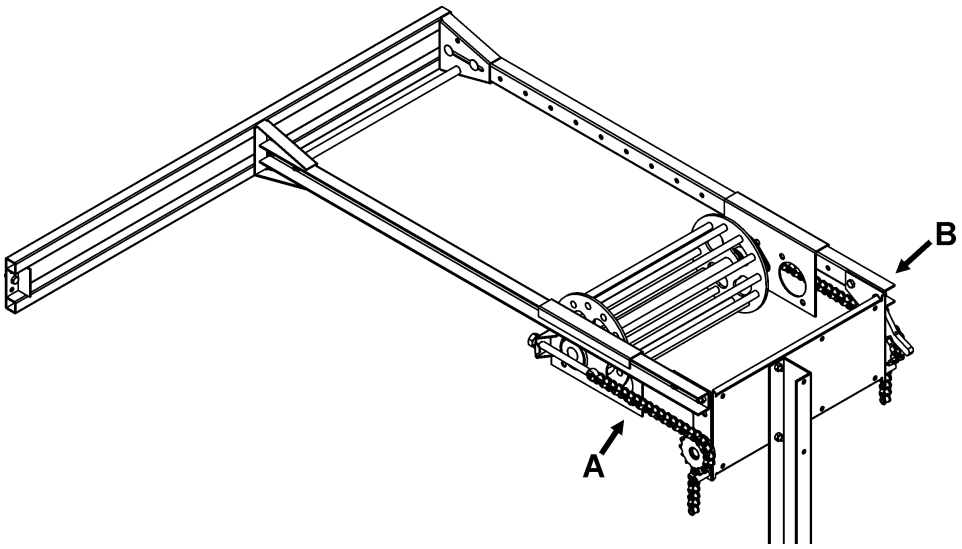


Pos.	Qty.	Code no.	Description
1	1	83-03-1714	detent pawl for idler roller with chain
2	1	99-10-3919	slotted pan head screw M 8x10 DIN 923 w/shoulder galv
3	1	99-10-3920	washer 10,5 DIN 433 verz
4	1	83-00-6107	tube 3/8" x 382 BD-C2+ idler of egg belt 245
5	1	39-00-4115	chain wheel 1/2"-14t-b17,5 dbl,w/nut -idler roller with chain
6	1	39-00-4116	chain wheel 1/2"-14t-b17,5 sgl idler roller with chain
7	2	99-50-1351	spring type straight pin 5x40 DIN 1481
8	1	99-10-1040	hexagon nut M 8 galv. DIN 934-8
9	2	99-10-1257	hexagon head screw M 6x 30 DIN 558 galv
10	2	99-10-3981	connecting socket round M 6x25

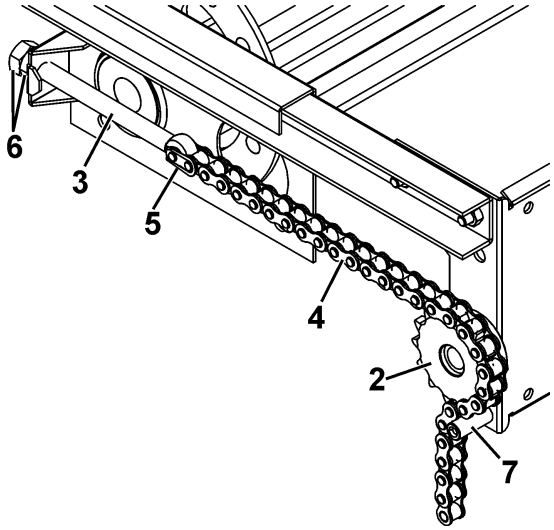
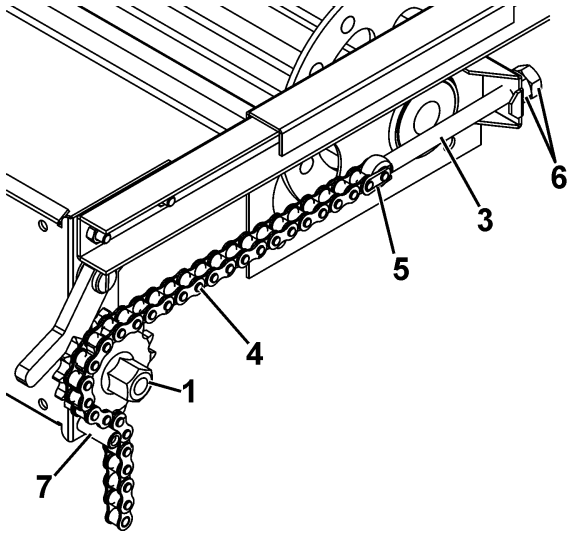
20.4.5.3 Assembly of the roller chain

Install the roller chain on both chain wheels of the tension shaft.

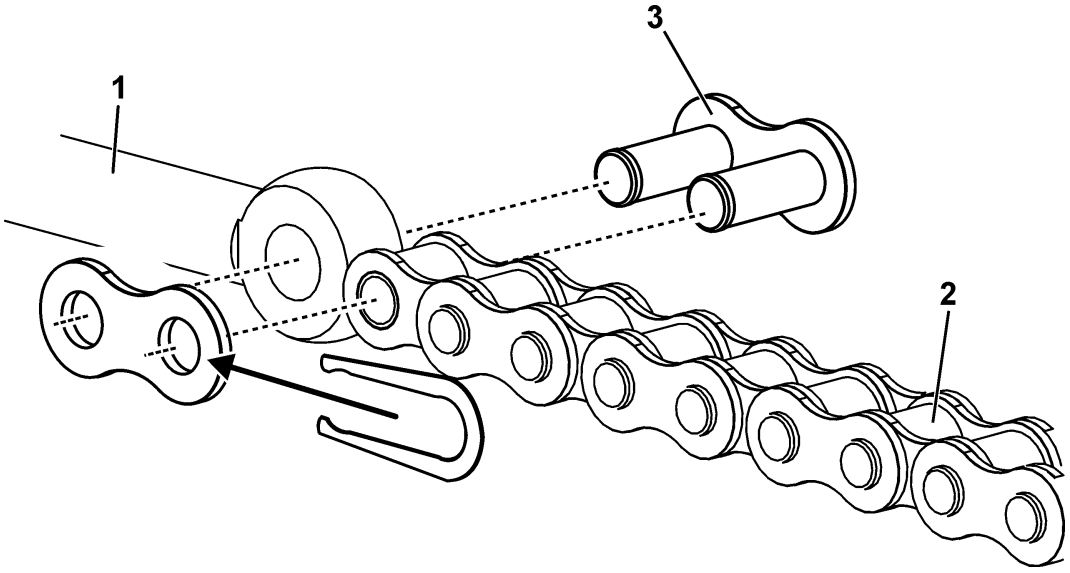
The detent pawl is only installed at the side with the double chain wheel.



Pos.	Qty.	Code no.	Description
1	1	39-00-4115	chain wheel 1/2"-14t-b17,5 dbl,w/nut -idler roller with chain
2	1	39-00-4116	chain wheel 1/2"-14t-b17,5 sgl idler roller with chain
3	2	39-00-4112	eye bolt M10x120 idler roller with chain
4	2	39-00-4030	roller chain 1/2" 48Gl
5	2	99-50-1241	chain joint 1/2"x5/16"
6	4	99-20-1029	hexagon nut M 10 galv. DIN 555

Detail A: chain wheel single	Detail B: chain wheel double
	

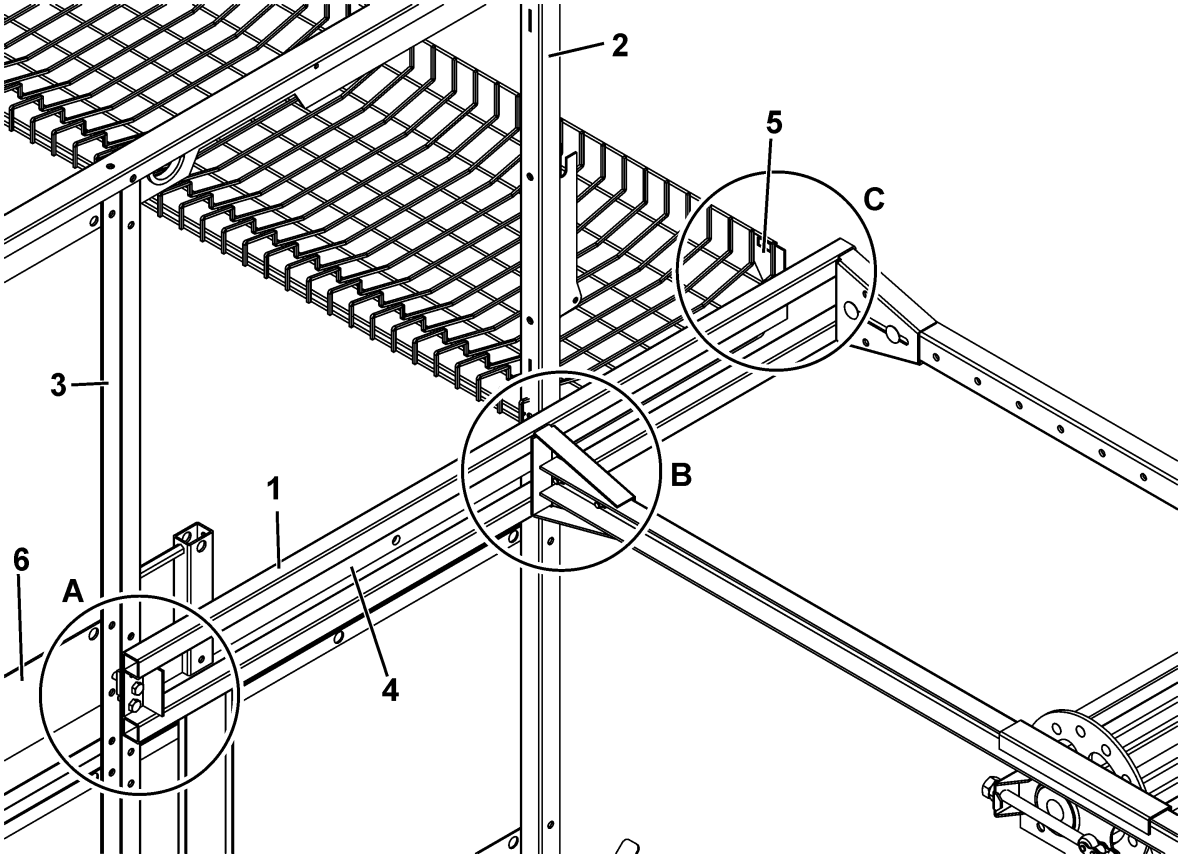
Connecting the roller chain with the eye bolt



Pos.	Qty.	Code no.	Description
1	2	39-00-4112	eye bolt M10x120 idler roller with chain (DIN444)
2	2	39-00-4030	roller chain 1/2" 48Gl
3	2	99-50-1241	chaint joint 1/2"x5/16"

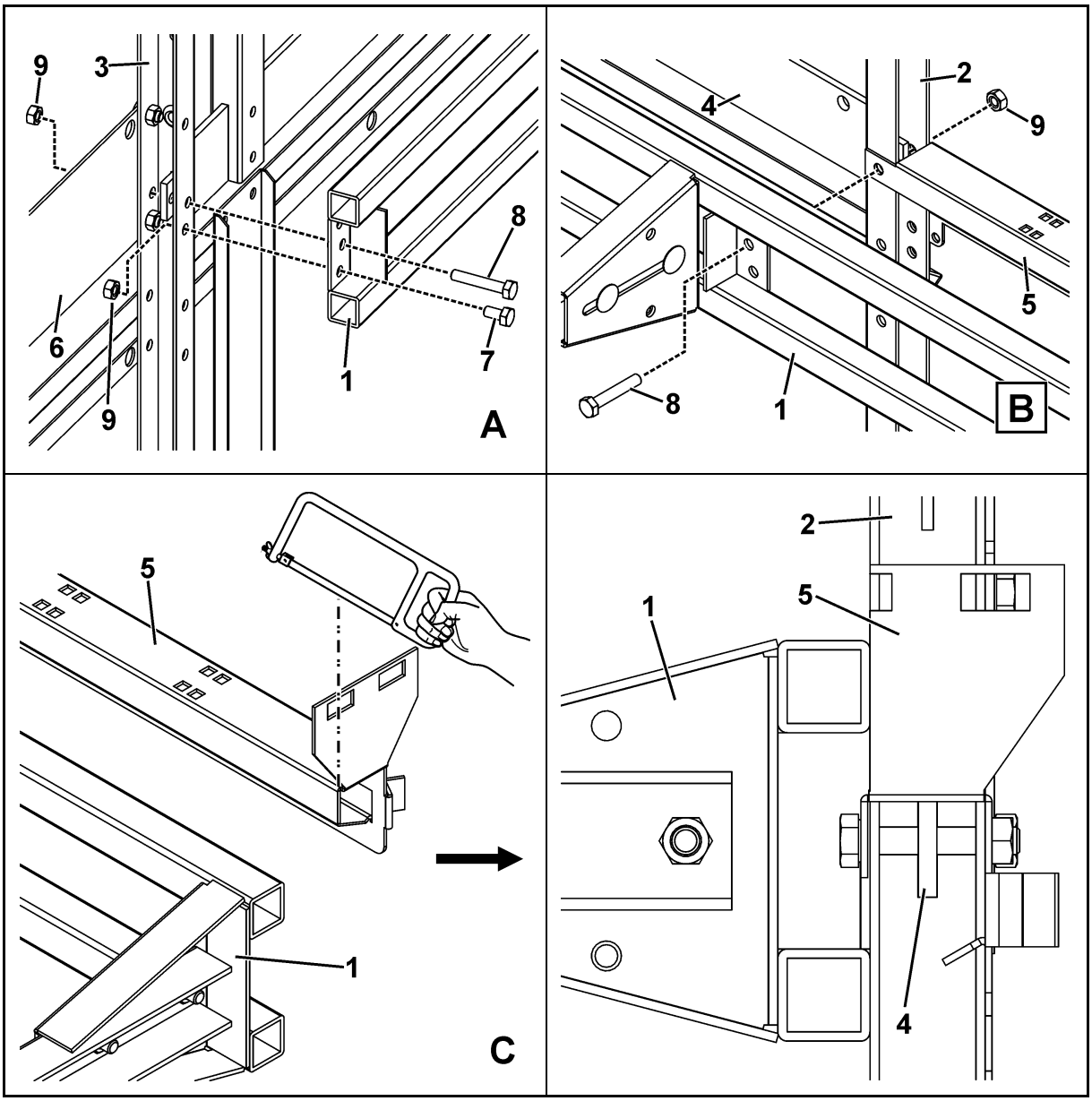
20.4.6 Connection to the section

20.4.6.1 Connection to the stand



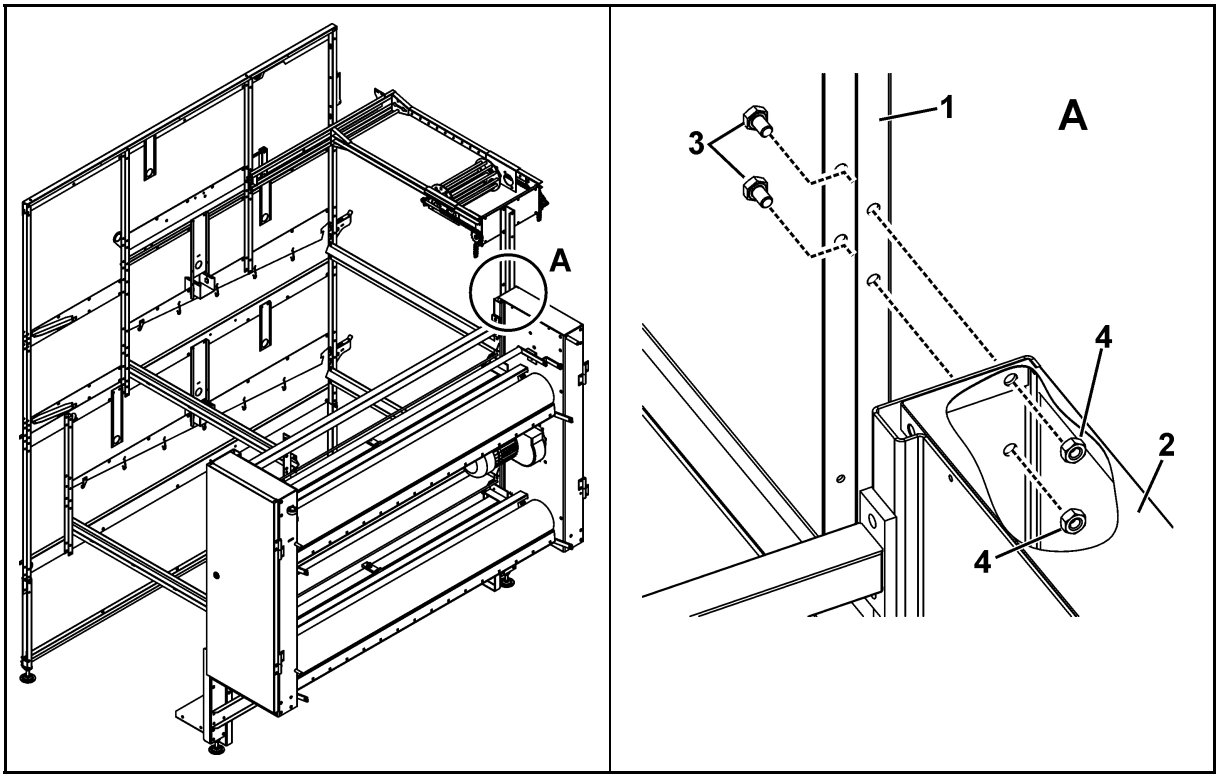
details A,B and C: see the following page

Pos.	Qty.	Code no.	Description
1	1	83-03-9951	fasteningframe NAT60 idler LB245 BD-C2+
2	1	83-04-3262	post feeding side NAT-60
3	1	83-04-3258	post in front of nest 2412 NAT-60
4	1	83-03-9685	cross member under nest bottom NAT-60 BD-C2+
5	1	83-03-9693	support for eggchannel LB245 nest NAT-60/BD-C2+
6	1	83-03-9716	extension separating wire mesh level before nest NAT-60-1800
7	1	99-10-1100	hexagon head screw M 6x 12 galv. DIN 933 8.8
8	2	99-10-1376	hexagon head screw M 6x 35 galv. DIN 931-8.8
9	3	99-10-1045	hexagon nut M 6 galv. DIN 934-8



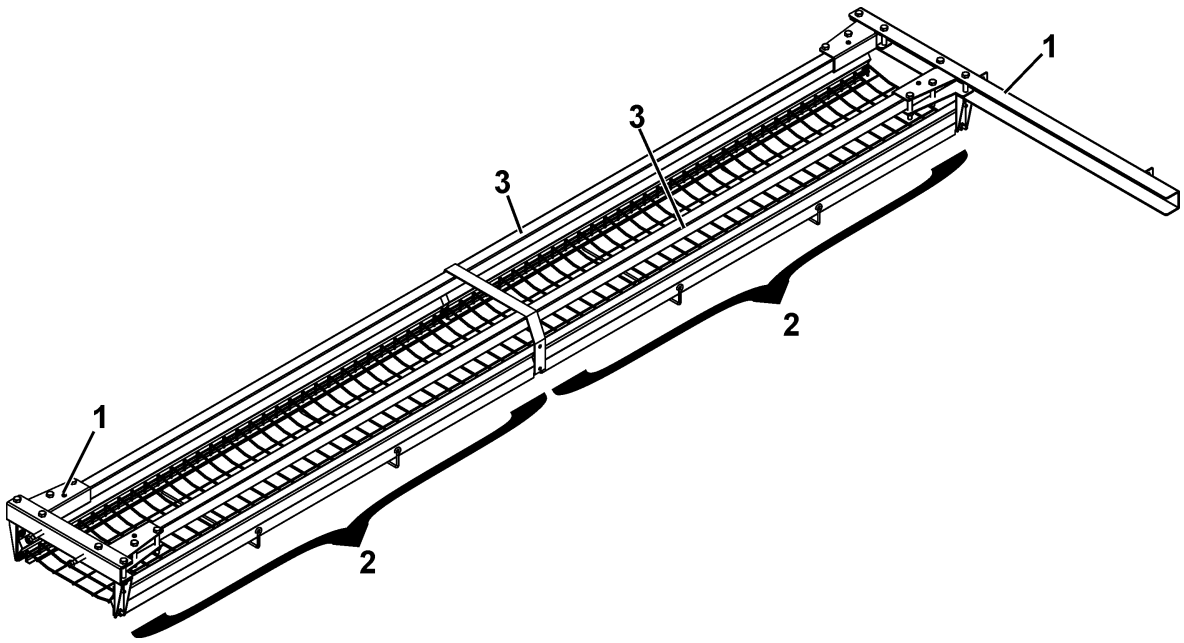
position numbers: see previous page

20.4.6.2 Connection to manure belt drive



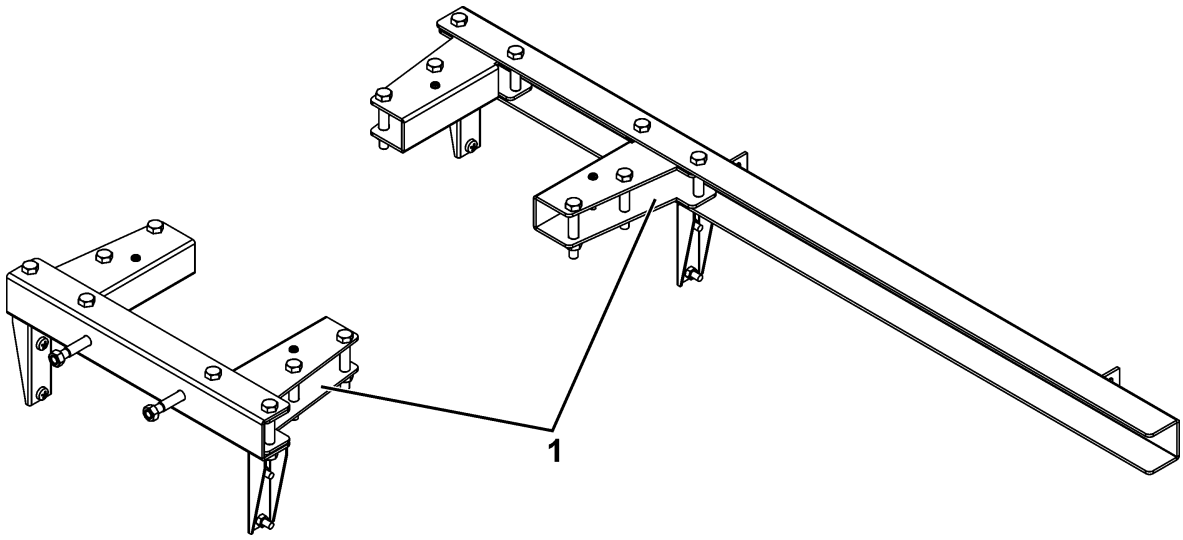
Pos.	Qty.	Code no.	Description
1	1	83-03-9953	Support f/frame of tension shaft Idler LB BD-C
2	1		manure belt drive
3	2	99-10-1287	hexagon head screw M10x16 galv. DIN 558
4	2	99-20-1029	hexagon nut M10 galv. DIN 555

20.5 Assembly connection longitudinal belt drive



Pos.	Qty.	Code no.	Description
1	1	81-05-5224	connection kit drive lb 245 to NAT 60 per tier/row
2	2	37-97-4880	extension per runn. mtr. egg-channel E245 NAT-60/BD-C2+
3		99-40-3102	rectangular tube 30x30x2-6000 galv. DIN 2395

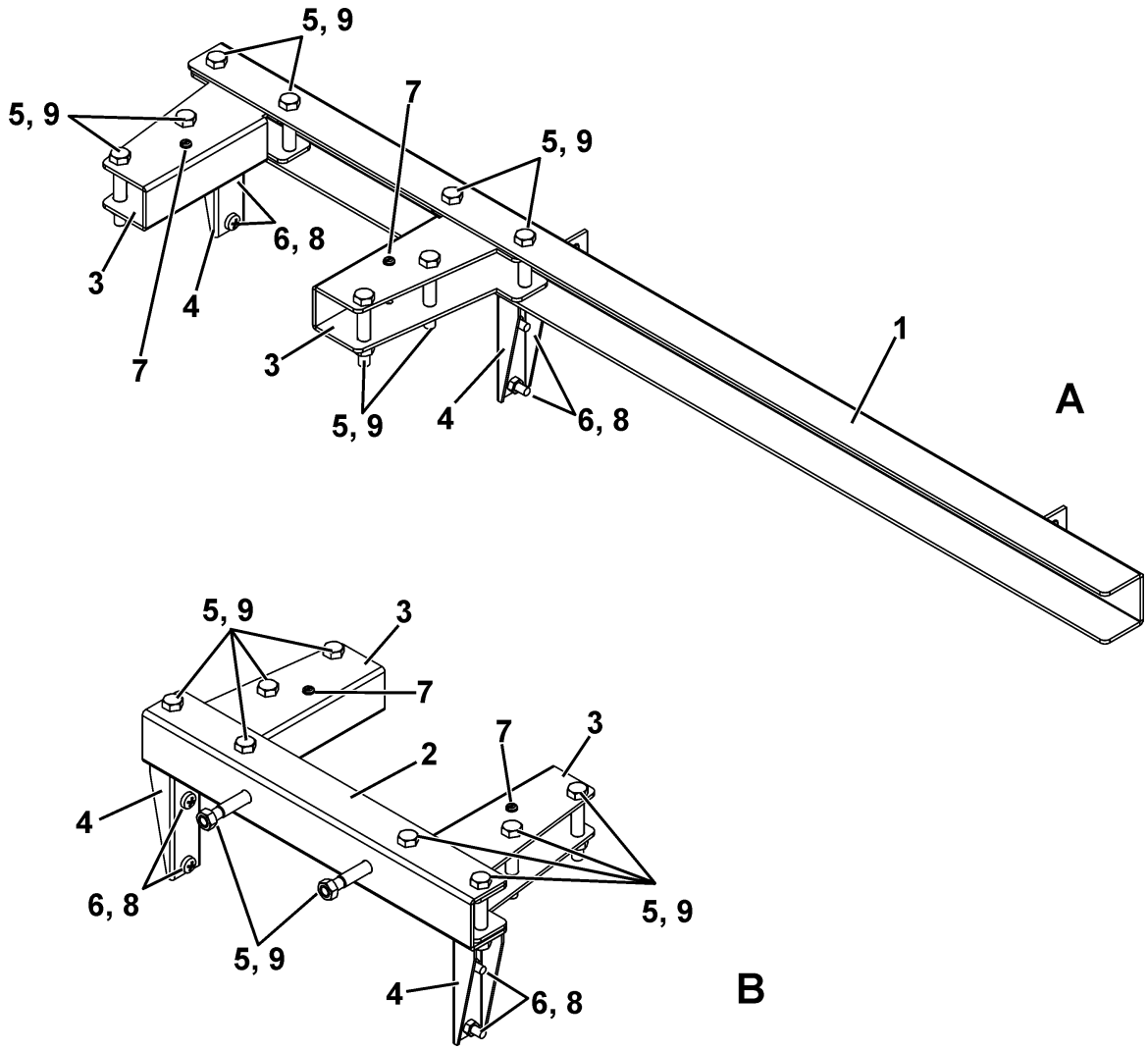
20.5.1 Connection set for longitudinal belt drive



Pos.	Qty.	Code no.	Description
1	1	81-05-5224	connexion kit drive lb 245 to NAT 60 per tier/row

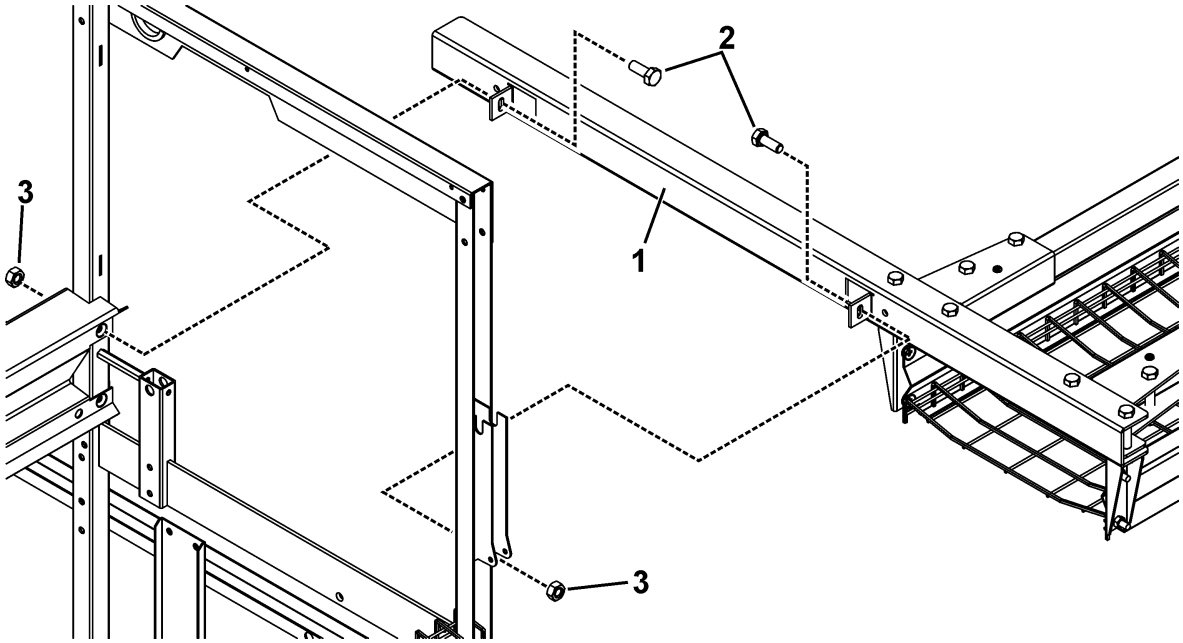
20.5.1.1 Components parts and screws for connection set l-b drive

A= connection to section	B= connection to l-b drive



Pos.	Qty.	Code no.	Description
1	1	83-03-9947	U-guiding rail universal for idler l-b
2	1		cross brace in front of l-b drive / elevator LB245
3	4	83-03-2430	adapter for cross brace connection of drive l-b w/nest
4	4	83-03-0092	bracket for egg channel connection of drive l-b w/nest
5	18	99-10-1265	hexagon head screw M 8x 55 galv. DIN 933 8.8
6	8	99-10-3872	mushroom head screw M 6x 16 galv. slotted
7	4	99-10-3882	drilling screw 4,8x 16 DIN 7504-L
8	8	99-10-1045	hexagon nut M 6 galv. DIN 934-8
9	18	99-10-1040	hexagon nut M 8 galv. DIN 934-8

20.5.1.2 Connection to the section



Pos.	Qty.	Code no.	Description
1	1	83-03-9947	U-guiding rail universal for idler l-b
2	2	99-10-1067	hexagon head screw M 6x 16 DIN 933 8.8 galv
3	2	99-10-1045	hexagon nut M 6 galv. DIN 934-8

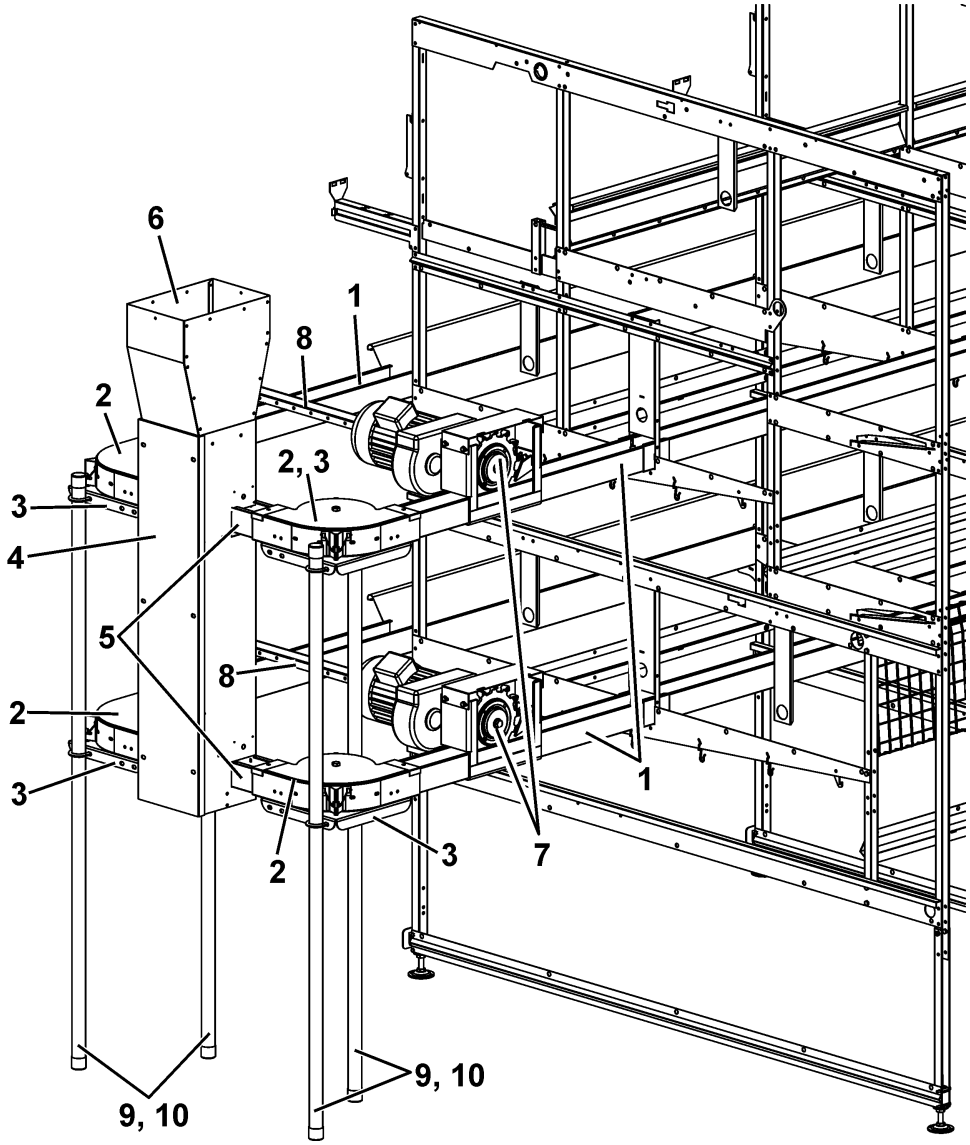
20.6 End-sets feeding

Important:

Due to the **different heights** of the **feed troughs of one level** in a section, this difference in height (approx. 5 cm) has to be **levelled** in the **end-sets** upon mounting.

20.6.1 Drive side

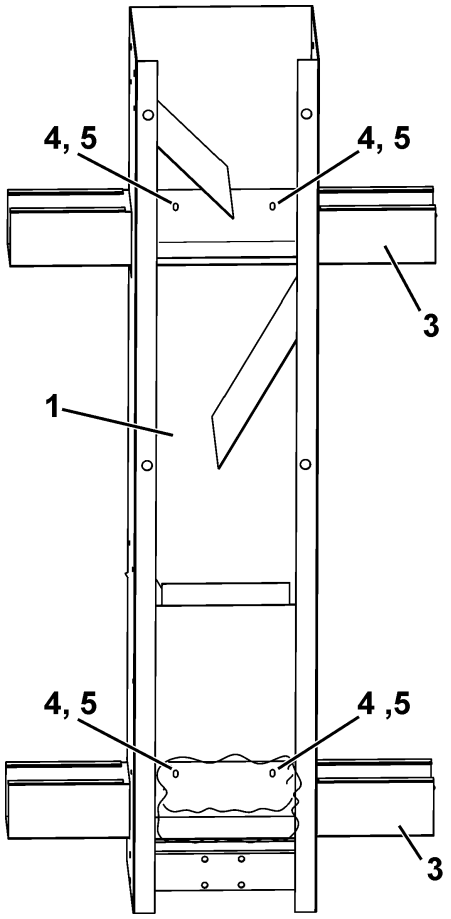
20.6.1.1 Pre-assembly of feed column



position numbers: see next page

Pos.	Qty.	Code no.	Description
1		15-20-1001	feedtrough 3000 regular 1,2mm (cut on site)
2	4	83-00-5966	corner 90deg BD2000
3	4	83-01-6324	corner support NAT
4	1	83-04-1033	feed column CAS-S ccw 2t NAT-60
5	2	83-00-4364	feedtrough 620/165 CAS ccw EV450/EV-P/KB120/ Uni178-1.t
6	1	83-04-1025	connection cpl onto f-c NAT-60
7	2	10-93-5000	drive MPF 1-L 12m 0,37KW ccw 400V 3PH 50Hz
8	2	10-93-3198	supporting profile f/drive MPF
9		99-40-3813	pipe 1"x6000 galv DIN 2440
10	8	65-97-3703	cap plastic for tube 1" GPN 250/33.7

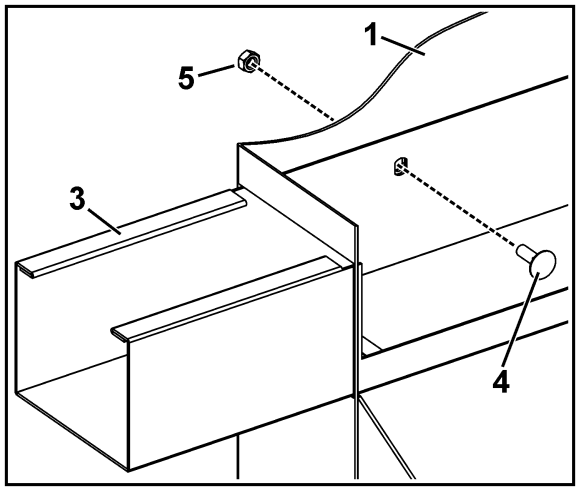
20.6.1.2 Screwing of feed troughs to the feed column



Each feedtrough inserted into the feed column will be fixed to the sheet casing by means of 2 mushroom head screws M 5x10 and nuts M 5.

Important:

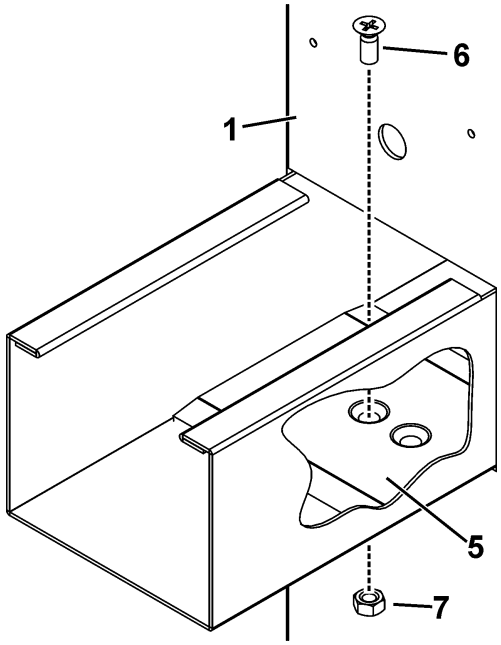
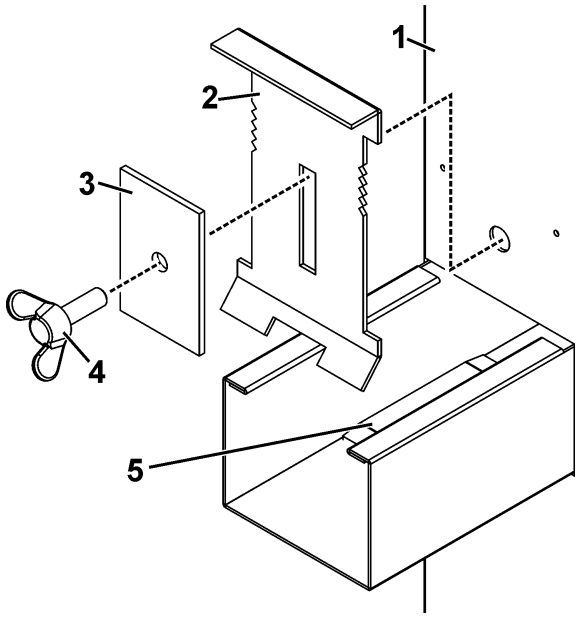
The mushroom head screws are inserted and screwed from inside the feed trough.



Pos.	Qty.	Code no.	Description
1	1	83-04-1033	feed column CAS-S ccw 2t NAT-60
3	2	83-00-4364	feedtrough 620/165 CAS ccw EV450/EV-P/KB120/ Uni178
4	6	99-10-1047	mushroom head screw M 5x 10 galv. slotted
5	6	99-10-1023	hexagon nut M5 galv. DIN 934-8

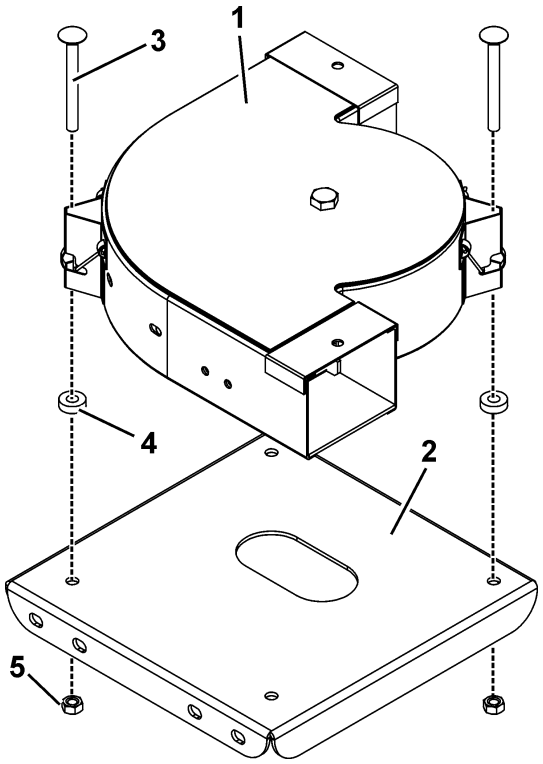
20.6.1.3 Installation of the guide shoes and feed level slides

	The guide shoes and feed level slides for every tier are mounted on that side of the feed column from where the feed is transported **out of the column** by means of the feed chain.

guide shoes	**Feed level slide**
Make sure that the guide shoes are mounted **centrally underneath** the feed level slides. The bore hole (hole close to the trough centre) for the fixing of the guide show in the feed trough has to be drilled on-site.	
	

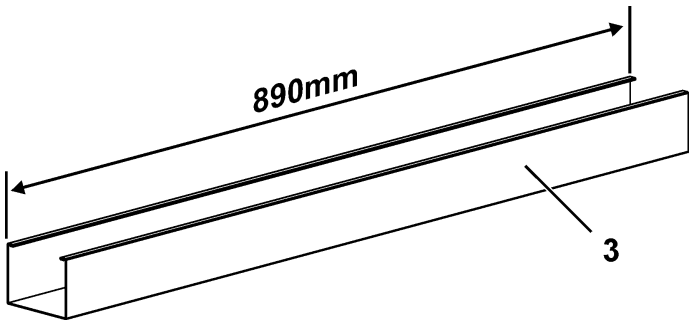
Pos.	Qty.	Code no.	Description
1	1	83-00-4422	feed column CAS ccw 2t NAT-Nova for 3 feed loops
2	1	38-91-3692	feed level slide for hopper MPF and feed column
3	1	38-91-3693	pressure plate for feed level slide
4	1	99-10-1121	wing screw M 8x25 DIN 316-GT-C
5	1	39-00-3599	guide shoe 2mm for feed column CAS/S
6	1	99-10-1698	countersunk screw/cross recess M 5x12 DIN 965-5.8 galv
7	1	99-10-1023	hexagon nut M 5 galv. DIN 934-8

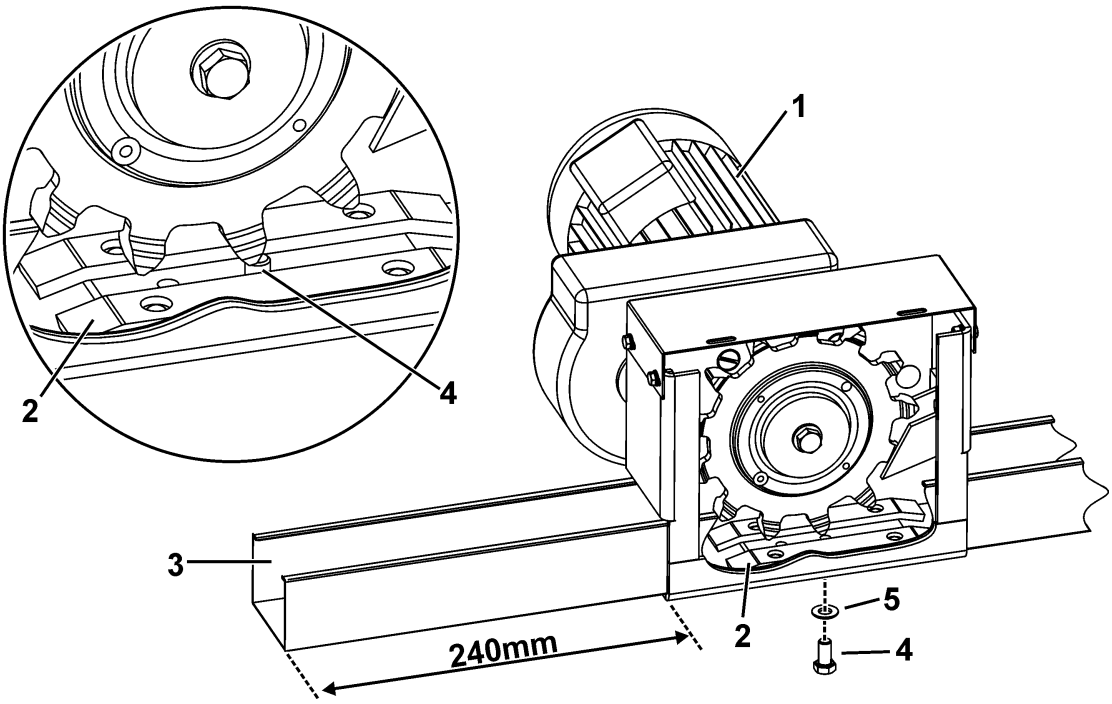
20.6.2 Pre-assembly of the corners 90deg BD 2000 and corner supports



Pos.	Qty.	Code no.	Description
1	1	83-00-5966	corner 90Grd BD2000
2	1	83-01-6324	corner support NAT
3	2	99-10-3857	mushroom head square neck bolt M 8x 80 DIN 603 galv
4	2	15-00-3711	washer PP-black 19x8,5-6
5	2	99-10-1040	hexagon nut M8 galv DIN 934-8

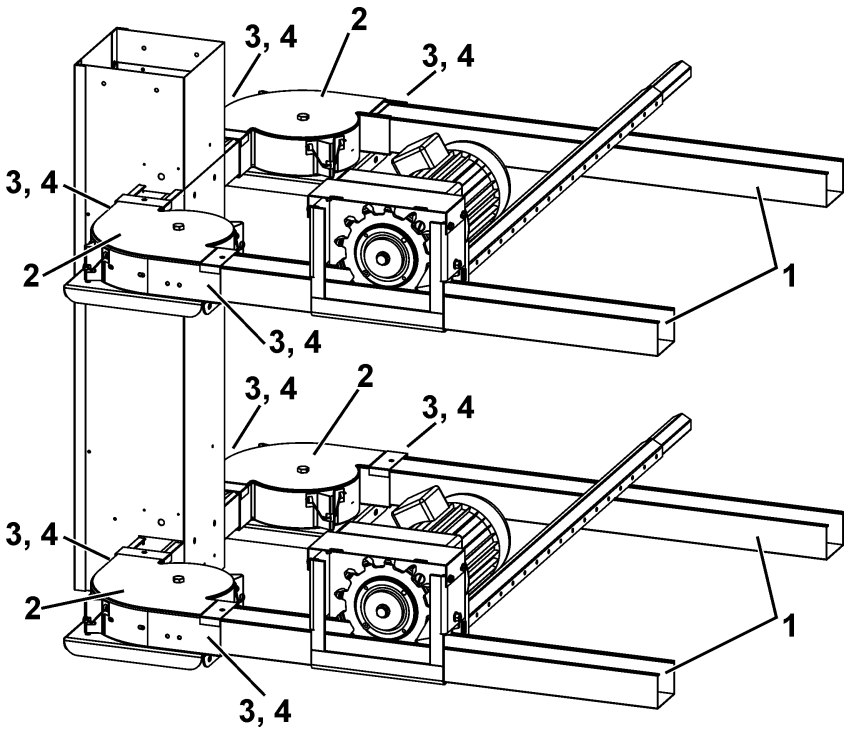
20.6.3 Pre-assembly of the MPF drives to the feedtrough

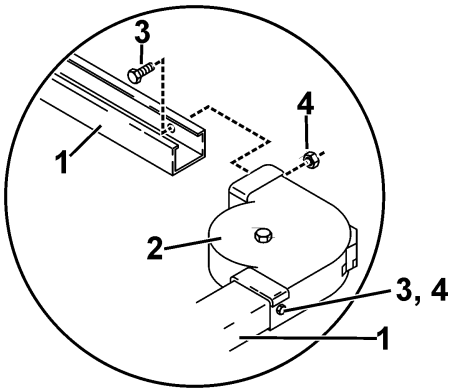
	The feedtroughs 3000 regular are cut to a length of 890 mm for the purpose of installation. 4 cuts are needed.



Pos.	Qty.	Code no.	Description
1	1	10-93-5000	drive MPF 1-L 12m 0,37KW ccw 400V 3PH 50Hz
2	1	38-91-3014	guide plates with base plate for guide shoe SF/MP
3	1	15-20-1001	feedtrough 3000 regular 1,2 mm (cut on site)
4	1	99-10-1068	hexagon head screw M 10x20 DIN 558 galv.
5	1	99-20-1055	spring washer A 10 DIN 127-galv.

20.6.3.1 Assembling the pre-mounted components





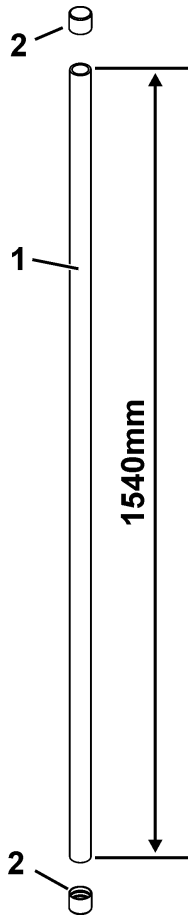
The corners are fixed to each feedtrough by means of a hexagon head screw and a hexagon nut.

The holes are to be made by means of of a drill (Ø 5,5 mm) on site.

Pos.	Qty.	Code no.	Description
1		15-20-1001	feedtrough 3000 regular 1,2mm (cut on site)
2	4	83-00-5966	corner 90deg BD2000
3	8	99-10-1241	hexagon head screw M 5x 12 galv. DIN 933 8.8
4	8	99-10-1023	hexagon nut M 5 galv. DIN 934-8

20.6.4 Assembly of the 1" pipes for supporting the feed column

20.6.4.1 Cutting the pipes and assembling of plastic caps

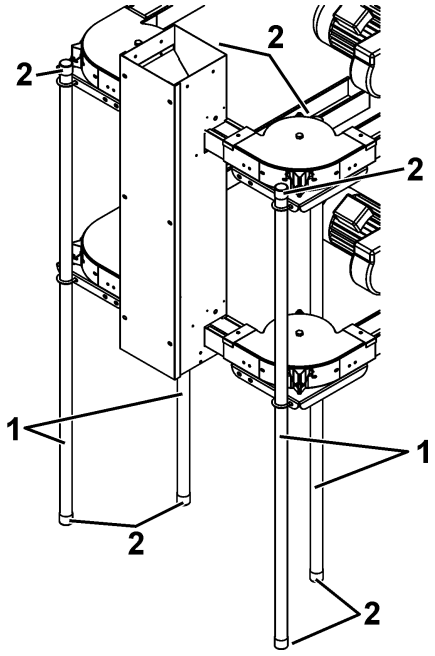


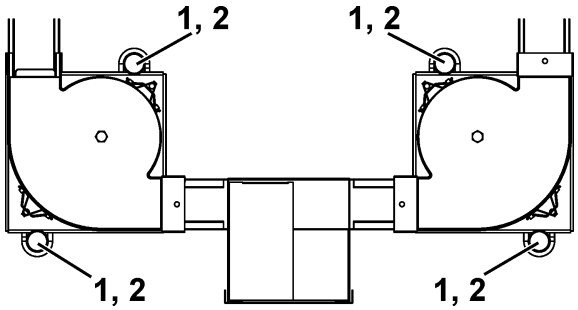
The pipes 1" (with a length of 6 m) are cut to a length of 1540 mm and are sealed with a plastic cap at both ends.

4 pipes with caps are needed for the support.

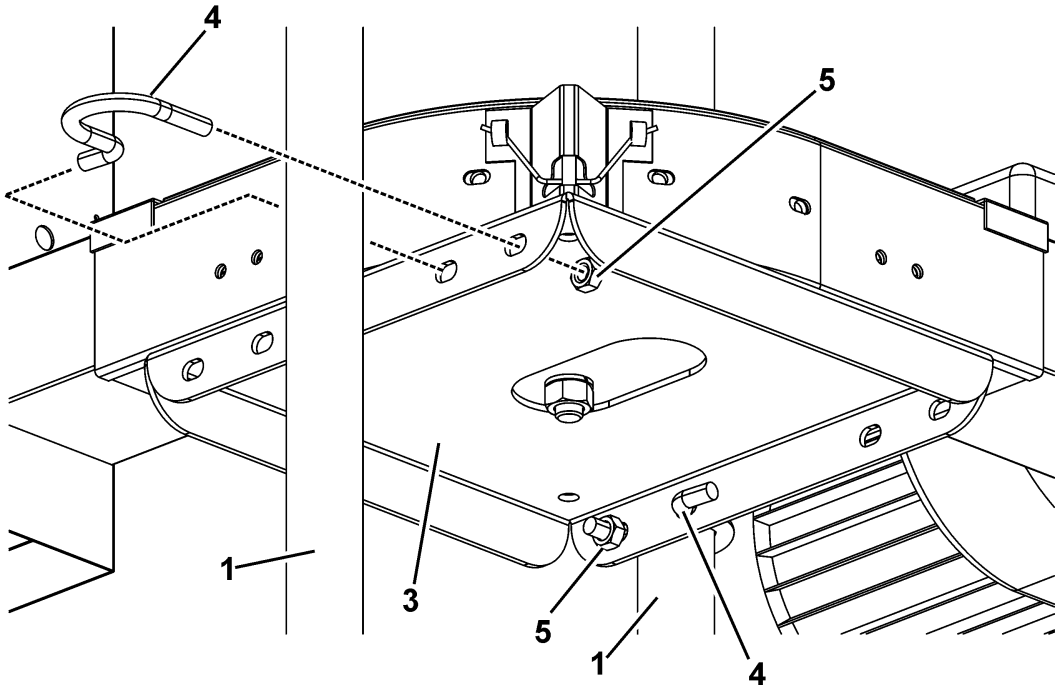
Pos.	Qty.	Code no.	Description
1		99-40-3813	pipe 1"x6000 galv DIN 2440 (cut on site)
2	8	65-97-3703	cap plastic for tube 1" GPN 250/33,7

20.6.4.2 Screwing the pipes to the corner supports





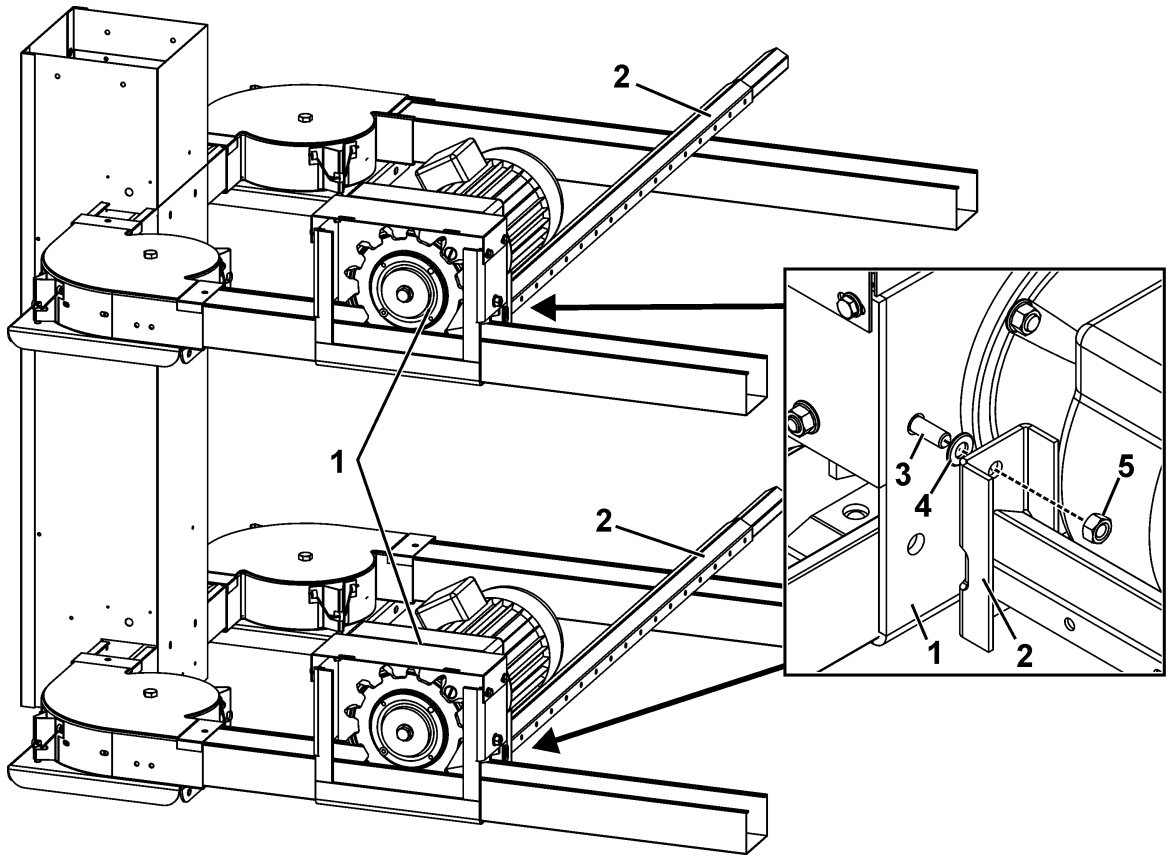
Each pipe will be screwed to **each** corner support by means of an U-bolt and hexagon nut.



Pos.	Qty.	Code no.	Description
1		99-40-3813	pipe 1"x6000 galv. DIN 2440 (cut on site)
2	8	65-97-3703	cap plastic for tube 1" GPN 250/33,7
3	4	83-01-6324	corner support NAT
4	8	99-50-3001	U-bolt galv 8x25/W35/H48 w/hook
5	8	99-10-1040	hexagon nut M 8 galv. DIN 934-8

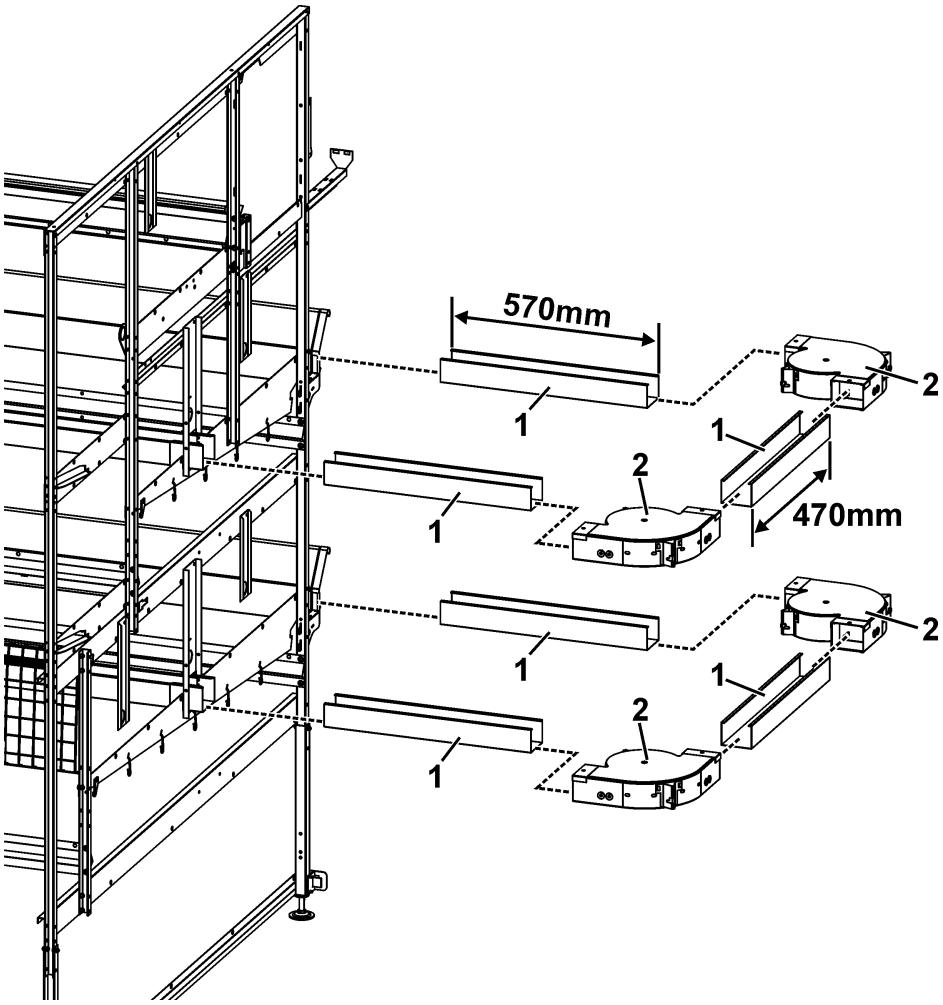
20.6.5 Assembly of the support for the MPF drives

	In order to keep the MPF drives in a horizontal position, every individual drive is equipped with a supporting profile and is thus supported by the opposing feed trough. The projecting end of the supporting profile is shortened after the assembly.

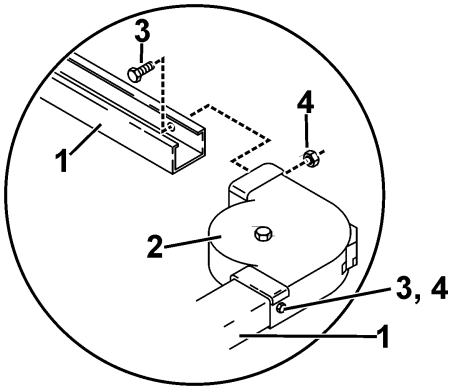


Pos.	Qty.	Code no.	Description
1	2	10-93-5000	drive MPF 1-l 12m 0,37KW ccw 400V 3PH 50Hz
2	2	10-93-3198	supporting profile f/drive MPF
3	2	99-10-3812	mushroom head square neck bolt M 8x 25 DIN 603 galv
4	2	99-20-1055	spring washer A 10 DIN 127-galv.
5	2	99-10-1040	hexagon nut M 8 galv. DIN 934-8

20.6.6 Drive side



Pos.	Qty.	Code no.	Description
1		15-20-1001	feedtrough 3000 regular 1,2mm (cut on site)
2	4	83-00-5966	corner 90deg BD2000
3	8	99-10-1241	hexagon head screw M 5x 12 galv. DIN 933 8.8
4	8	99-10-1023	hexagon nut M 5 galv. DIN 934-8

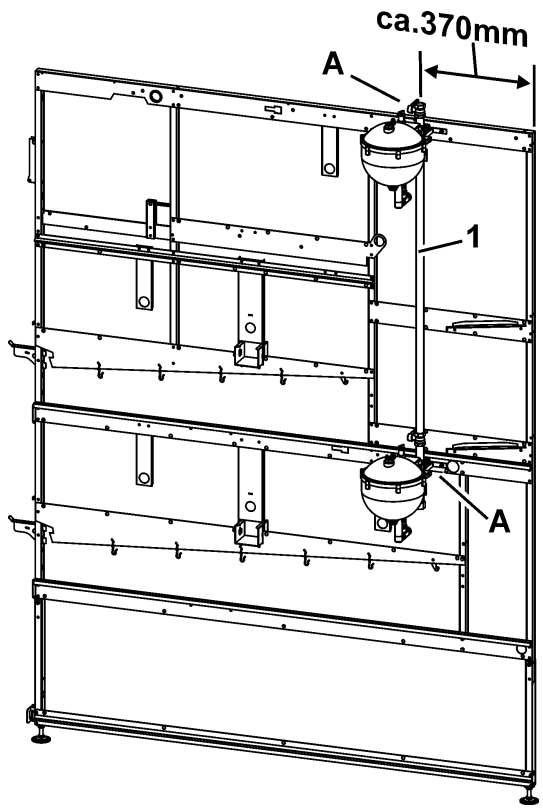


The corners are fixed to each feedtrough by means of a hexagon head screw and a hexagon nut.

The holes are to be made by means of of a drill (Ø 5,5 mm) on site.

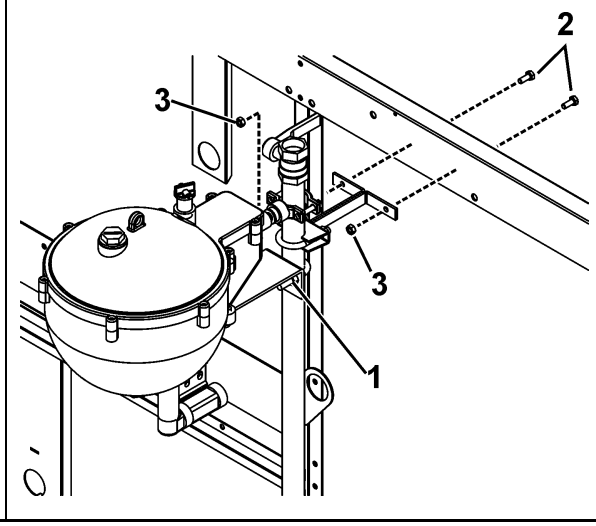
20.6.7 Assembly of water supply

By default the water wall is installed at the end of the row equipped with the manure belt idler unit.



The water supply will be screwed to the cross supports at positions A with a distance of approximately 370 mm to the outside edge of the stand.

The corresponding holes have to be drilled on site. (Ø6,5mm)



Pos.	Qty.	Code no.	Description
1	1	83-03-9932	water supply 2t with ball tank NAT-60/lower tank to shut off
2	4	99-10-1067	hexagon head screw M6x 16 galv. DIN 933 8.8
3	4	99-10-1045	hexagon nut M6 galv. DIN 934-8

21 Attaching the service board

☞	The maintenance instructions will be made according to the order, i.e. it is customized to your house equipment. Affix these maintenance instructions to an appropriate place near your system (e.g. end wall in the house area).